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NEWSPAPER

VIRTUAL NEWS

DOS/VS 29 Gives More Support

WHITE PLAINS, N.Y. – Release 29 of Disk Operating System/Virtual Storage was announced last week by IBM.

This system control programming offers both additional device support and new functions designed to help improve system performance and simplify multiprogramming operations, IBM said.

DOS/VS can be used with System 370 virtual-storage models 115 through 158. Among the devices supported by Release 29 is the 3340 direct-access storage facility, announced in March. It writes more than 1.5M bits of data per square inch on the disk surface in the 3348 module.

DOS/VS Release 29 is now available at no charge, IBM said.

IBM also announced the availability of DOS/VS Sort/Merge, a program product said to provide improvements in virtual mode performance by reducing the time required for address translation. The program is available immediately under a license agreement for $60/mo.

Other peripherals supported for the first time by DOS/VS are: 3203 and 5203 printers, 3450 diskette input/output unit; 3420 magnetic tape unit, models 4, 6 and 8; 5425 multifunction card unit, and the 3780 data communications terminal for remote job entry.

Also, Generic Device Assignment is a new function that simplifies computer operators' and programmers' tasks since it handles certain jobs automatically. For example, the operator does not have to specify that data be stored in a specific tape drive.

Release 29 will automatically find an unused tape drive and store data there.

In addition, the Generic Device Assignment function permits input/output devices to be pooled, providing more efficient use of these devices, IBM added.

Additional functions in Release 29 in-

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DP Data Bases Affected?

Rule Broadens Fair Use Copyright Exception

By Jerry Cohen
Special to Computerworld

WASHINGTON, D.C. – Many copyright notices forbidding computer storage and/or copying of published material may be ineffective and unenforceable, according to a recent decision by the U.S. Court of Claims.

The court has ruled that government users, libraries and other not-for-profit organizations enjoy "fair use" exceptions to copyright liability; the effect of the decision may broaden this exception to other data processors who build data bases from published literature.

Judge Oscar H. Davis announced the ruling Nov. 27; the 4-3 decision reversed a lower court ruling of early 1972.

The suit was filed in 1968 by Williams & Wilkins Co., a Baltimore publisher of medical journals, against the Federal Government to obtain compensation for copying by the National Institute of Health and the National Library of Medicine.

The government agencies claimed exemption from copyright liability under the doctrine of fair use, an impreeise common law exception to the coverage of copyrights (one which has commonly been used to protect extensive quotations or abstracts in book reviews or other critical commentaries from charges of infringement of copyright on the work involved).

Without ever spelling out the line between fair and unfair use, the courts have cited (a) purpose of the use, (b) nature

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Job Rescheduling Is Hard But Compromise Eases Task

The human problems can be overlooked since the workload is being cut back in the interest of surviving the energy crisis, not as a result of giving in to pressure from others in the organization. Dennis Chastain

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The energy crisis has instilled an air of compromise in almost everyone – the 50-mph speed limit and the 68-degree home-heating limit are obvious examples. If DP job-run priorities are reevaluated with the same attitude, the project should work well, Dennis R. Chastain believes.

But Chastain, a performance analyst with the General Accounting Office, confesses that putting priorities on work to be done at a DP center to get through the energy crisis may, in fact, be one of the hardest ways of solving the problem.

GETTING THROUGH THE ENERGY CRISIS

Evaluate Workload

Setting priorities is a valid approach in concept, Chastain admitted, but it inevitably causes many conflicts. Human nature, personal competition, office politics and job security all can make managers fight hard to get top priority for their work.

Chastain said last week that politics "necessarily" involved in setting priorities on the workload could leave irreparable harm in the wake of such an effort.

The undesired side effects, however, can be avoided, Chastain noted, by undertaking a far more fundamental, and very likely long overdue, evaluation of the workload. This analysis should ideally come up with a "keep on using/stop using" decision on whole applications or on subsets of the system, he said.

Every manager has at least 10 reasons why his work should have number one priority, after payroll. Everyone's first priority is to get paid, the analyst maintained. Resolving the conflicts between managers and establishing an approved priorities scheme for processing as much of the workload as possible is, as a minimum, a difficult and frustrating experience.

An honest review of the workload with

(Continued on Page 3)

Does Justice Have Bell In Antitrust Gun Sights?

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Justice Department may be aiming its antitrust guns at AT&T although officially no suit has yet been filed.

The Antitrust Division has issued a Civil Investigative Demand (CID) to the Bell System requiring certain documents be provided pertaining to "interstate private line services," according to an AT&T spokesman.

'Document Subpoena'

The CID was described as a "document subpoena" by a government source. It is intended to provide the Justice Department with information and indicates an investigation is in progress, the source said, but the issuance of a CID is not accusatory in nature and a follow-on suit is merely a possibility but not a certainty, he added.

The Justice Department demand for documents was issued "late last month," AT&T said, and covers contracts, pricing policies, practices and correspondence. The documents are to be provided by Jan. 14, AT&T said, adding that it would comply.

The issuance of the CID is reportedly an outgrowth of the recent Senate subcommittee hearings on the communications industry. During those hearings held by the Senate Judiciary Antitrust Subcommittee, Justice Department representatives were described as interested onlookers.

Appearing before the subcommittee (CW, Aug. 15 and Aug. 29) chaired by Sen. Philip A. Hart (D-Mich.) were users, non-carrier equipment suppliers, specialized carriers and FCC economic experts. Much of their testimony dealt with

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2 Firms Switch To DP...Uncover 2 Fraud Schemes

By Marguerite Zientara
Of the CW Staff

The computerization of accounting systems in two separate cases has uncovered alleged embezzlements totaling hundreds of thousands of dollars.

The larger fraud concerned a Wall Street brokerage house, Cowen & Co., from which Englishman Henry Brady, a clerk at the firm, allegedly swindled $170,000 over a period of six years through a girlfriend's account.

According to Detective Frank Donahue, who made the arrest Nov. 12, the account was originally opened with only $300. Through manipulation of the journals, Brady allegedly used monies from other accounts to buy and sell several million dollars worth of securities. Police said

(Continued on Page 2)

IBM to Give U.S. Deposition List

By a CW Staff Writer

NEW YORK – A new phase has begun in the U.S. vs. IBM antitrust suit, with a list due this week of some 530 companies IBM intends to contact for depositions.

This marks the "first wave" of third-party depositions, and it also signals the final stages of mutual depositions between the Justice Department and the computer industry leader.

The list of the companies IBM intends to subpoena was expected at last Wednesday's hearing before Judge David Edelstein, in the U.S. District Court for the Southern District of New York.

Hearings have been scheduled for this week (Dec. 11), and for next Wednesday (Dec. 19) in the case.

Edelstein chastised the parties for the

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CONTRIBUTORS: J. DANIEL COUGER, education column; ALAN TAYLOR, Taylor Report and professional practices.

NEAL WILDER, vice president – marketing. DOROTHY TRAVIS, sales administrator. JUDY MILFORD, advertising coordinator. KATHRYN V. DINNEEN, market research.

LEETE DOTY, production manager. HENRY FLING, production supervisor.

W. WALTER BOYD, publication manager. PATRICK J. McGOVERN, publisher.

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529. Washington: Room 1129, National Press Bldg., Washington, D.C. 20004. Phone: (202) 638-0901. Telex: 89-544. Los Angeles: 963 N. Edgecliffe Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. Europe: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW19 PF, England. Phone: (01) 458-2248/9. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

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Ruling Broadens Fair Use Exception

(Continued from Page 1)

of the copyrighted work, (c) amount of material used and (d) effect of use on the copyright owner's potential market as relevant factors.

The copyright question has grown in economic importance over the last decade with the advent of low-cost, convenient photocopying and data base storage generating single copies of published works or extracts of published works on demand. The publishers claim this reduces their natural market for multiple copies. They also quote a 1967 Health, Education and Welfare Department study of the copyright fair use exception saying, "Babies are still horn one at a time, but the world is rapidly being overpopulated."

Pending copyright revision legislation would only establish a commission to study the proper relationship of copyrights to computers and photocopy machines.

The Williams & Wilkins claim was referred to a trial commissioner who in February 1972 ruled that the fair use exception did not apply to the government libraries, thereby holding the U.S. liable in a tentative decision, subject to review by the seven judges of the court.

Judge Davis emphasized that the libraries involved were non-profit institutions and that the copy requesters, as well as the libraries, were acting in behalf of scientific progress *"untainted by any commercial gain."*

Casting about for other distinctions to limit the scope of this decision as a precedent, Davis also pointed to copying limits imposed by government librarians and lack of proof of dollar value of the damage to the publisher. He also refused to consider the publisher's claim that it was offering a practical royalty payment plan to avoid need to resort to fair use.

Davis said this is a problem for Congress.

Appeal of the decision to the U.S. Supreme Court is likely.

Switch to DP Uncovers Frauds

(Continued from Page 1)

after Brady was caught, the net loss amounted to about $400,000. This included $170,000 that Brady had pocketed himself, they charged.

When the computerized system was put in last January, Donahue said, it was immediately seen that funds that belonged in certain accounts were missing. According to Andrew Daponte, DP manager for Cowen & Co., the system that was written for this application flags an account when it's in deficit, with no supporting monies in the account for the stock. Since Brady was the margin clerk in charge of the accounts in question, the company conducted an investigation and asked Brady to explain the situation. At that time, Brady excused himself from the room, and caught a plane to London, Donahue said.

Upon hearing of his return to the U.S., Donahue and his partner arrested Brady, who was arraigned and held in lieu of $100,000 bail. His bail has since been reduced and he is presently out on bail, according to Donahue. There has been a presentment to the grand jury but as yet no indictment has been handed down.

Guilty Plea Entered

In the second case, Marguerite Pells pleaded guilty to the embezzlement of approximately $15,000 to $21,000 from Burke Sale Co., Seattle, Wash., over a period of two years.

Pells, who was both cashier and accounts receivable bookkeeper for the firm, was pocketing cash from salesmen's returns, according to deputy prosecutor Douglas Strandberg. Then when she received checks from various chain stores, she credited the salesmen's cash accounts with these amounts and did not credit the chain stores, he said.

When the company switched to a computerized system, Strandberg continued, it sent out an up-to-date billing to all the customers. The customers were at that time billed for all the money that had actually been paid but not recorded.

Pells, according to Strandberg, "knew it was coming" and confessed what she had been doing to the president of the company. "It wouldn't have been uncovered and she wouldn't have come forward and confessed except for the fact that it was going to he discovered as soon as the companies had a chance to check the bills and complain to the company," Strandberg said.

Pells was released on personal recognizance and awaits sentencing scheduled for Jan. 2.

DPer, Non-DPer Can Get Together

NEW YORK – When non-technical managers are faced with decisions affecting the data processing and other technical departments, there is often a language barrier which makes it difficult, if not impossible, to obtain the necessary information.

Non-technical managers are often awed by the technical expertise of their subordinates and the mystique of computers, said Sylvester J. Huse, vice-president – accounts and finances, AT&T, at a conference here recently.

The Solution

The way to avoid language barriers, according to Huse, is to "not allow one to be built up." Executives should demand that proposals be explained in common business language, he said, but added that managers should also "do their homework" and know what is going on in the technical departments.

Managers should never rely solely on technical subordinates for decision-making. The technician can furnish the "blueprints" but the executive, in consultation with others at his level or higher, must decide "whether to build the house," Huse noted.

Huse also addressed the question of whether to consult third parties. He suggested that a third party be consulted only when the scope of the planned project is big enough and costly enough, but even then it depends on the company's objectives and its operating budget.

Is U.S. Eyeing Bell?

(Continued from Page 1)

AT&T's market policies.

It is believed that the Justice Department has been in contact with the FCC staff since AT&T Board Chairman John DeButts initiated a new hard line with regard to competition from both the specialized carriers and non-Bell equipment vendors. The AT&T chief called for an end to competition pending new FCC hearings.

Also, Microwave Communications, Inc. has filed suit in U.S. District Court to prevent AT&T from withholding certain interconnection facilities to MCI's customers. Both MCI and AT&T are competing for interstate private-line customers and it is in this same area that the government has requested documents from AT&T.

IBM to Give U.S. List

(Continued from Page 1)

slow pace of the discovery proceedings, telling them to resolve their differences or bring them before the court, so he could issue any rulings necessary to speed up the case.

IBM indicated its depositions would be complete by next September, and that most of these statements would in fact be ready by early summer. A schedule for completion of the pretrial evidence gathering extends to next June.

It was indicated there may be more statements to be obtained from some government agencies, but the bulk of mutual discovery is complete.

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Impersonal Machines Add Personal Touch to Bank

By Patrick Ward
Of the CW Staff

WINSTON-SALEM, N.C. – The Wachovia Bank & Trust here is implementing a "personal banker" system to bring the personal touch to its business and computers are making the new approach possible.

The bank, with assets of $2.5 billion, has appointed 450 personal bankers through its 168 branches who are given lists of bank customers for whom they will handle deposit accounts, most loans and other customer needs, according to James T. Brewer, the bank's senior vice-president.

The computer ties customer checking accounts, savings accounts, installment loans and other dealings with the bank into a central information file.

The personal bankers will eventually be able to access the records from the on-line central information file to get a picture of the customer's total relationship with the bank.

So, when the personal banker is talking with a customer, "he is not just sitting there as a loan officer talking about a loan today, oblivious to a nice deposit account the customer may have," Brewer remarked.

The bank is now using an interim system that gives the bankers a monthly list of customers and their services, Brewer said.

Next year the bankers will begin using telephones to access the central file. While no date has been set to introduce terminals, the system has been designed for them, Brewer said.

The bank adopted the personal approach, Brewer explained, because "it seems to be a complaint or concern of people that the computer controls so much of our life, and if you have a foulup in billing it's hard to straighten it out."

In addition, the bank did a personal interview research project two years ago that pointed to the need for a personal banker:

"Our conclusions were that people feel somewhat frustrated in dealing with banks, not just because of the computer," Brewer mentioned.

"They feel frustrated in that when they open an account they open it with a new accounts clerk, and then when they have another need they don't have ready access back into the bank unless they go through a switchboard and start explaining – they don't have any personal contact back into the bank.

"There were ramifications that led us back to the fact that we could solve a lot of the customers' frustrations in dealing with any large institution . . . if we could give them a name and a phone number of a qualified person whom they could call for anything they need," Brewer added.

Public response has supported that view, Brewer commented:

"I think we underestimated the frustrations, if anything, because the acceptance has been so great."

But without computerization behind the system, "we could not begin to do what we're doing," Brewer remarked.

The bank uses an IBM 370/158 under VS-1 with 1M byte in handling its personal banker service.

The Wachovia Bank and Arthur S. Kranzley & Co. of Cherry Hill, N.J., codeveloped the soft ware for the personal banker system, according to Kranzley, firm president. The firm, he added, will market the package to commercial banks next March, under the catalog title, Retail Account Information System (Rais).

The software is display-terminal-independent and also application-independent, Kranzley said, in that "existing batch processing systems can be interfaced with this system without major modifications."

The Wachovia Bank's personal banker approach meant a "relatively insignificant" personnel cost increase, with DP costs taking the greater part of the expense, according to Brewer.

But there was a dollar and cents reason to go to this approach, Brewer added.

Consumer accounts – individuals and small business firms – will continue to increase their share of the bank's total business, he stated. The personal banker approach can help attract these customers, he said, adding that the bank's principal measurement of the new approach's value "will be how we perform in terms of market share."

Release 29 Supports More Peripherals

(Continued from Page 1)

clude:

- Reorganization of Core Image Library and Directories which reduces the number of computer internal operations required to locate and load a program for execution.
- Shared Virtual Area (SVA) permits application programs in various memory partitions to share the services of a single program, such as Vsam. Since Vsam is not duplicated in each partition, more space is available for the application programs.

In addition, short tasks are executed slightly faster since Vsam does not have to be reloaded in the partition for each task. Placement of a new System Directory List in the optional SVA also increases performance.

- Job Control changes, reducing the number of times DOS/VS takes control of the system to handle a task. By eliminating such system interruptions, application programs can be executed more quickly.

Right Attitude Makes Job Changes Work

(Continued from Page 1)

a go/no go decision in mind would overcome much of the haggling. Chastain feels, because most of the jobs that would have ended up with politically unsatisfying low priorities will be partially or completely eliminated. And the cancellation would be at the suggestion of an enlightened manager, in his manager's eyes.

Some installations have tried to reevaluate and eliminate some of the work done on their computer systems, but these have not yet been very successful, he admitted. The reason for this failure, he went on, is undoubtedly linked to the same kind of political concerns that even now would hamper a priority-setting scheme.

The human problems, however, can be overlooked since the workload is being cut back in the interest of surviving the energy crisis, not as a result of giving in to pressure from others in the organization. With this approach the manager who urges the dropping of some of his less crucial work comes across as a "knight in shining armor" and not as a knight who lost a battle against the other managers, Chastain concluded.

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Doctors Say Privacy Jeopardized

State Seeks to Halt Abuses

N.Y. Drug Prescription Plan Continues, Despite Suits

By Marguerite Zientara
Of the CW Staff

ALBANY, N.Y. — The New York State Department of Health, faced with two law suits both claiming violation of patient-doctor confidentiality rights, is proceeding with its plan to computerize records on prescriptions for drugs such as morphine, methadone and amphetamines.

Two separately issued temporary restraining orders were dropped Aug. 27 and Sept. 14, respectively, allowing implementation of a state law that became effective last April.

The restraining orders were lifted by judges in New York City and Rochester because they felt the complaint of invasion of privacy was not sufficient to outweigh the public health concerns that the system seeks to address: to trace drug usage in different geographical areas and to be on the lookout for overprescribing.

No dates have been set for arguments of the two law suits.

The Controlled Substances Act, passed by the 1972 Legislature, gives the department "sweeping responsibilities" with relation to the manufacture, distribution and dispensing of narcotics and dangerous drugs, according to Dr. Hollis S. Ingraham, state health commissioner.

The controversial requirement of the new law states that physicians and other practitioners issuing prescriptions for Schedule II controlled substances (those which have an accepted medical use but which have a high potential for abuse or dependency) must issue them on triplicate official prescription forms to be issued by the New York State Bureau of Narcotic Control (BNC). One copy of the prescription is to be retained by the practitioner; one to be retained by the dispensing pharmacy and one filed with the BNC by the dispensing pharmacy on a monthly basis.

According to the law, the triplicata form must include:

- Name, address and age of ultimate user.
- Name, address, Bureau of Narcotics and Dangerous Drugs (BNDD) number, telephone number and signature of prescribing physician.
- Specific directions for use, including but not limited to dosage, frequency of dosage and maximum daily dosage.
- Date on which prescription was signed by prescribing physician.

'Privacy Invaded'

One of the lawsuits was filed in New York City last March by the Empire State Physicians Guild, Inc. and several individuals against Ingraham as the state health commissioner. The suit claimed the act "violated the Fourteenth Amendment of the U.S. Constitution in that, by requiring disclosure of the identity of certain patients it invades the patient's right of privacy and confidentiality, infringes on the doctor's right to prescribe treatments for his patients solely on the basis of medical considerations and discriminates against persons suffering from certain diseases by requiring their identification to a governmental agency as a condition to receiving medical treatment for their illnesses."

The suit asked for a three-judge court to be convened to argue the constitutionality of the law and that an injunction be granted against the department.

On April 6, Judge Robert Carter issued an injunction stating that although the forms had to be used (since the law states that the triplicate forms are the only legal means of dispensing the drugs), the health department was enjoined from computerizing the information.

On June 18, another suit was filed in Federal Court in Buffalo by the New York State Physicians Union and several individuals. That suit cited violations to the right of privacy guaranteed by the first, ninth, 10th and 14th amendments to the U.S. Constitution by "casting a chilling effect upon a physician's right to pursue his profession or livelihood in a confidential manner."

The union also cited infringements on the fifth and 14th amendments' protection against self-incrimination, the use of physicians as agents of the state in violation of the fourth and 14th amendments, and the right to care for health under the ninth and 14th amendments.

On July 19, Judge Harold P. Burke issued an injunction against the health department pending a decision of a three-member federal panel requested by the union.

Plans Continue

Since the Sept. 14 announcement by the New York State Attorney General's office that the last restraining order had been vacated, the department is going ahead with its original plans, according to Marvin G. Nailor, executive assistant to Ingraham.

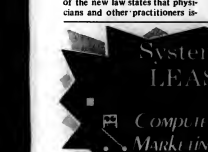
Computerization of the forms will allow the department to uncover irregularities such as forgeries fraudulent obtaining of dangerous drugs and thefts of prescription blanks and their misuse by unauthorized persons, according to Nailor. The information will also show if a patient has obtained prescriptions by going from doctor to doctor or if stolen prescriptions are being used. Instances of overprescribing or overdispensing drugs will be apparent from the information, he said.

According to Dr. Robert P. Whalen, second deputy commissioner of the health department, triplicate copies received by the department, as well as tapes or punched cards produced from them, will be given special handling and kept in locked, secured areas when not in use, with access strictly circumscribed by the commissioner.

According to Whalen, a similar multiple prescription procedure has been in effect in California since 1940, in Illinois since 1958 and in Idaho since 1967.

Chester R. Hardt, chairman of the Temporary State Commission to Evaluate the Drug Laws, said in a March 8 statement to the N.Y. Legislature: "Our independent investigation of these systems in California and Illinois has failed to reveal one single case of the invasion of a patient's right to privacy, despite the fact that these other systems make use of massive computer printouts of patients' names, which we do not."

According to Nailor, physicians had to include the same information (name and address of patient, type of drug, etc.) before triplicate prescriptions were required. The prescription was kept in the pharmacy, but could be scrutinized by a narcotics investigator upon request.



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PROGRAMMING METHODS A DIVISION OF GTE INFORMATION SYSTEMS

What's Both Blessing, Curse?

By Toni Wiseman
CW Staff

CHICAGO — The computer dilemma is a "mixed dilemma of blessings and blasphemies," Harvard Law Professor Arthur Miller said here recently.

On the positive side, he cited the experimental use of computer-linked sensors which are being used to accumulate a data base on the biochemical changes which occur prior to a heart attack. A data bank of such information could be the precursor of an early warning system for victims, he said.

On the negative side, he continued, is the possible use of the computer to control the environment in which a person is moving, including the amount of light and temperature as well as such variables as marijuana odors.

In the same vein, he cited the example of a proposal to surgically implant sensors in the entire prison population to facilitate monitoring after parole.

"This means that if the sheriff detected mounting aggression through the sensors, he could invoke preventative detention," Miller said.

"We have today the seeds of a highly organized and centralized data bank for the control of society," he said, "the type of womb-to-tomb dossier foreseen by Orwell and Huxley."

But, he went on, the problems of remote sensing and surveillance are down the road; data banks are here and now.

Every data bank has, at least as its original purpose, some socially valuable and justifiable purpose, he said.

"NCIC (National Crime Information Center) is valuable," he said, "we want law and order but how much should we have to pay for it? Credit bureau data banks make good sense, but do we want that information passed around?

"I'm not advocating a 'smash a machine a day' program," Miller said. "But we have to learn to maximize the benefits of this technology while minimizing the deleterious effects."

Our society is operating according to Parkinson's Law, he noted, — as man's ability to accumulate data increases, he fills that capacity and then enlarges it.

Miller offered a comparison of Form 1040 in 1950 with that filed for last year's tax returns. These newer forms, he maintained, reveal an amazing amount of concrete information on a person's financial status, activities and social relationships, as well as extrapolative deductions on mental and physical status.

"I fear that information extraction is becoming an American way of life," he said. "We've become anesthetized and no longer question why the information is necessary, becoming less and less cognizant of the possible effects. In fact, we have an almost Pavlovian response to requests for information."

As a result of the unrest in the 1960s, Miller revealed, military intelligence units have the names and addresses of some seven million people, dossiers authorized by the President. These include dossiers not only on the Weathermen, SDS, KKK; the vast majority of these "marked" people were those who had signed petitions, sought social equality, members of the ACLU, NAACP, etc. "It would make a wonderful mailing list," he added.

Miller made his remarks at the recent Chancellor Kent International Law Society meeting.

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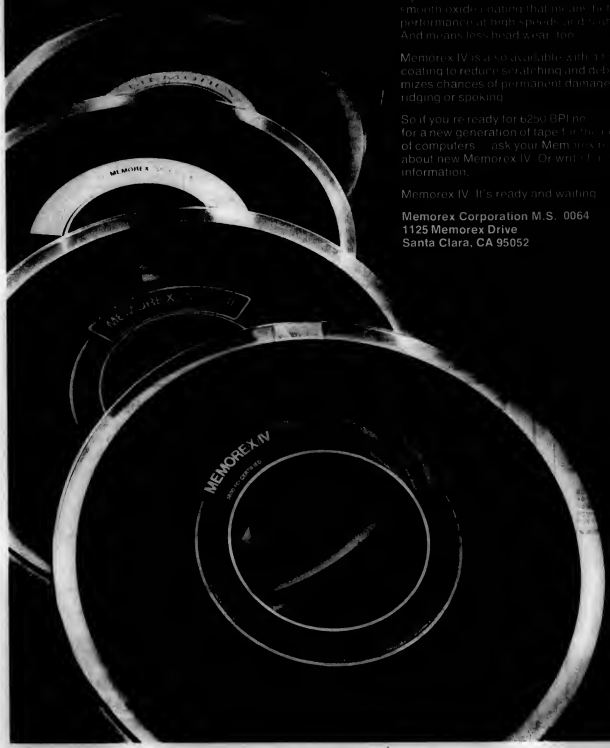

Women Making Strides

Unemployment for DP Specialists Jumps 1% in '70-'72

By E. Drake Lundell Jr.
CW Washington Bureau

WASHINGTON, D.C. – While unemployment among most groups in the engineering, scientific and technical fields increased "slightly" between 1970 and 1972, unemployment among computer specialists rose a full percentage point, according to the Department of Commerce's Bureau of the Census.

At the same time, however, the rate for the overall technical fields and the computer field is still far lower than the unemployment rate for the nation as a whole, it was reported.

Between 1970 and 1972 the overall rate for engineers as a group rose from 2.4% to 2.5%, with especially high rates found among aeronautical and aerospace engineers.

The computer specialists showed an increase in unemployment from the 1.3% rate shown in 1970 to 2.3% in 1972 while the rate for systems researchers and analysts went up only slightly from 2% in 1970 to 2.2% in 1972, according to the report prepared this fall for the National Science Foundation.

Out of a total of 257,000 computer specialists in 1972, 49,000, or 19%, were women. In some other areas the percentage of women in the profession was as low as 1%, the report showed, and the only group ahead of the computer specialists was mathematical specialists with 27% of the workforce being women.

In the area of systems researchers and analysts, only 7,500 of the 81,000 in the field (9%) were women, according to the figures.

Computer specialists, with a median age of 32.8 years, was the youngest group surveyed, while engineers was the oldest with a median age of 42.1 years, according to the study.

And the women among the computer specialists are younger than the men with a median age of 29.3 years compared with the men's median of 33.5 years.

Computer specialists, however, do not stack up well in the area of graduate degrees, with only 11% holding such honors while 12% of the systems researchers and analysts have them and a whopping 58% of the social scientists have advanced degrees and 15% of the engineers have more than their B.S.

Corrections Plan Stresses Program Continuity

By a CW Staff Writer

JOLIET, Ill. – "Throughout the entire criminal justice structure, one most readily agreed upon concept is the need for relevant, accurate and timely information," Russell H. Levy said at a DP conference here recently.

"To date," he said, "most efforts toward the development of criminal justice information systems have been in law enforcement, but the application to corrections may be equally significant."

In the area of corrections, he said, there is an opportunity to analyze the physical, psychological and social factors behind the behavior which results in commitment, an understanding of which is essential for the development of effective crime prevention programs.

Professionals, he added, have long recognized the need for program continuity from commitment through confinement, aftercare and release. "In Illinois," said Levy, project director of the Illinois Corrections Information System, "correction has now taken steps to develop the necessary information gathering and reporting systems which are required for continuity in rehabilitation."

The Department of Corrections consists of the Illinois Youth Commission and the Adult Corrections Segment of the Illinois Department of Public Safety. The two were merged in January 1970.

"Historically," Levy said, "management of an Illinois corrections institution has been a task which permitted few mistakes, and budgetary allocations tended to reflect a concern for building and maintaining escape-proof fortresses rather than for treatment and rehabilitation programs.

"In such circumstances, each facility or division gathered information to satisfy its own needs," he said. Under the new system, the Research and Long Range Planning Division is responsible for central information services, but, he added, historically fragmented information systems and data bases still present barriers to the exchange of information.

"The collection of the information must be integrated into the daily routines of each facility," he said. "If an individual is recommitted, the systems must be able to locate previous history and update it. The data base developed as a byproduct of this activity must then be available for such activities as program evaluation and research."

Levy considers the professional staff attached to the Department of Corrections a vital resource, closely correlated to the information system.

"By improving data uniformity and availability and providing additional analytical tools, the professional may be more efficiently utilized," he said. "And by specializing some data gathering and analytical tasks, more routine tasks, more routine functions may be transferred to para-professionals."

Levy listed several benefits which the department expects to derive from its corrections information system:

- Improved capability for research and program evaluation, resulting from the formation of uniformly coded and coordinated data.
- Reduction of system fragmentation.
- Improved security of offender data from centralized record control and reporting, together with advanced techniques to control access to computer data files.
- Improved interfaces with other agencies will result from the presence of a central clearinghouse for all data.
- Improved personnel and facility utilization.
- Improved decision-making capabilities as a direct result of the existence of a data bank which relates fiscal, personnel, program and offender data and allows the production of coordinated management reports.

(related story on Page 8)

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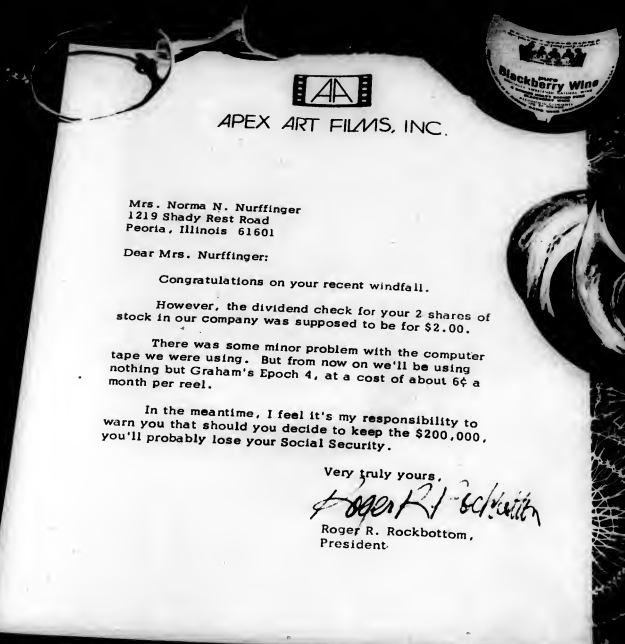

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- Have computer center employees sign a non-disclosure employment contract.
- Maintain a separation of duties among systems analysis, programming, computer operations, data preparation, data control and librarian functions.
- Ensure adequate supervision and scheduling of work assignments.
- Rotate personnel, including supervisory personnel, on sensitive computer processing and programming assignments.
- Inform computer center personnel of the security requirements of critical or sensitive systems.
- Set up a continuing security education program to acquaint your computer center personnel with the need for overall protection of equipment, programs and data, and of their responsibilities for preserving the privacy of confidential data.
- Keep the operations staff well-trained in the mechanical details of the equipment and the operating systems.

This checklist was compiled by ECF Systems Ltd., 74 Victoria St., Toronto, Ont. M5C 2A5.

Corrections Plan A Modular One

CHICAGO – The Illinois Department of Corrections has implemented the first phase of its Collection Information System (CIS), the Reception and Diagnostic Center Module, with funding provided by the Illinois Law Enforcement Commission. Three modules are currently under development: institution, field services and analysis for management.

While the CIS will encompass all aspects of the comprehensive corrections process, an official said one of the major efforts currently under way is the Adult Parole Services Subsystem.

The major objectives of this system, consultant Russell H. Levy said, are:

- To provide information about an individual's adjustment on parole, highlighting those problems which are retarding his reintegration into the community.
- To present a collective "mukeup" of the parole population to assist Parole Services administrators in maximizing their resources.
- To assist in the streamlining of clerical functions performed in the parole zone offices.

"The core of the Adult Parole Service Subsystem is the APS Turnaround Document," Levy said. "The form includes 16 areas under the generic categories of parole status, personal adjustment, health care problems and employment-education status."

The form, he said, is completed monthly for each person on regular parole, semiannually for those living out of state, and at least weekly for those under close supervision.

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Editorial

A Balm or a Bane

Computers are becoming more and more like strong medicine – despite the positive results there are often undesirable side effects.

Recent examples include Electronic Funds Transfer Systems, medical data banks and supermarket point-of-sale systems. In all of these, the habits, if not the rights, of the consumer could be drastically affected.

With all these systems, the motives of the developers are clearly meant to simplify procedures and reduce the costs for the banks, markets and medical insurance companies that will use the systems.

Their motives to utilize new technologies to make operations more efficient are commendable, but the systems must not impose their constraints on an unwilling public without proper safeguards.

Letters to the Editor

EFTS Is Just a Network For Bank Communications

This is in response to Dale Reistad's article, "Forbes 'Misunderstood' EFTS – Privacy Not the Issue," in the Nov. 28 issue which pointed out the numerous errors in Rep. John Forbes' speech on the Electronic Funds Transfer System (CW, Nov. 7).

The point which has escaped Forbes, and apparently *Computerworld*, is that the proposed EFTS is a communications network which would permit the nation's 13,000 commercial banks to transmit debit and credit transactions to one another electronically in a yet to be determined standardized format. These transmissions would take the place of checks, drafts, charge card sales tickets and similar pieces of paper which are now physically transported all over the country.

Proposals have been made that savings banks, savings and loan institutions and non-bank credit card companies should also be permitted to make use of the network for funds transmission.

The principle of the EFTS is by no means new. Millions of dollars of funds transmissions take place every day through the facilities of Bank Wire and the Federal Reserve electronic network. Currently, these transactions involve only banks and their large commercial customers. In the future, transactions of individuals and smaller business could also be transmitted.

Customer account records would continue to be maintained by the individual, independent banks. I am confident that these banks would continue to maintain their high standards of confidentiality of customer records. The picture of a monster data base located somewhere containing all of an individual's financial transactions and records is utterly absurd.

The banking industry is highly competitive and the customer is still king. No one is going to force any new system or procedure on the American public. The customer bought the checking account, and more recently, the bank credit card, because these services offered advantages to the customer in handling his financial affairs. He will buy the EFTS only if it offers demonstrable advantages to him.

I have difficulty in understanding the almost paranoiac obsession with the invasion of privacy matter. Whatever real or imagined dangers there may be in computerized criminal information systems, credit bureau systems, etc., the same principle does not hold true with the EFTS. Invasion of privacy would be a danger here to the same extent it is in the transmission of data over the facilities of AT&T or Western Union.

John R. Walker
Senior Vice-President
The Fort Worth National Bank
Fort Worth, Texas

Privacy Not Endangered

Rep. John R. Forbes shows a great lack of knowledge concerning the nature of EFTS plans, both those in operation and those being planned.

Preauthorized billing EFTS plans used by a billing company are voluntary on the part of the consumer. If the consumer doesn't like them, he won't sign up and he will pay his bills as he does now, by check, money order or cash.

The role of the banking system in such systems is exactly the same as its role in check payment systems; namely – to be the middle man operating a payment mechanism which both parties (biller and payer) find desirable.

The only credit role a bank has under EFTS systems is the same as the current check system – to determine whether a consumer has enough in his account to cover a payment. If not, the check or its electronic equivalent is returned to the biller.

Not all EFTS plans involve loss of time or dollar amount control to the consumer, in particular, the bill-check approach (recently initiated by banks in Atlanta) gives the consumer the right to specify not only dollar amount and payment date for each separate bill received, but also lets the consumer decide whether to use the system on a month-by-month basis.

The individual's right to privacy is a very significant social issue, and I agree it must be safeguarded. However, I don't think that right is endangered by EFTS systems, as the electronic payment records are typically not systematically stored in any centralized data banks.

Daniel Sitomer
Second Vice-President
Chase Manhattan Bank
New York, N.Y.

Who Are the Good Guys?

After considerable analysis, I think that I have been able to distill the thoughts expressed by Dale Reistad. They are:

Point 1 – Banks and computers are good guys. People are no damn good, and everyone knows that.

Point 2 – Forbes doesn't understand the problem. We aren't going to give people credit. We're going to take their money.

Point 3 – Forbes still doesn't understand. Besides, banks are so great that most people have two (or more) accounts.

Point 4 – Banks will code the information about people and purchases, and, of course, banks being such good guys will not use the information or sell it to anyone else.

Point 5 – Forbes is wrong. Take my word for it.

Point 6 – At this point in time, what I said in point 2 above is inoperative.

But then, of course, like Rep. John Forbes, maybe I don't understand either.

Bryan Wilkinson
Hollywood, Calif.

Consumers Have Options

As one of a number of bankers devoting considerable time to study and development of Electronic Funds Transfer Systems (EFTS), I must take exception to the "alarmist" preaching of Rep. John R. Forbes.

EFTS preauthorized bill payment plans as proposed in many areas, and in limited operation in California and Georgia, are strictly optional to the consumer.

Contrary to Forbes' statements, banks would not be providing credit for all bill payment. The merchant would continue to provide credit as at present. Subsequently, on the bill due date, the bank would charge the customer's account (provided he had funds or credit available) and deposit payment to the merchant's account.

Under EFTS a user may continue to have multiple credit cards (although he may decide for his own convenience not to have so many), bank charge cards and bank accounts (at different banks if he wishes).

The EFTS preauthorization plans in use today and planned for expansion in other areas include the provision whereby a user who has established a preauthorization payment plan can, in effect, "stop payment" on an automatic charge. Further, even if he doesn't, he can still unequivocally request and obtain reversal of a preauthorized charge with which he does not agree.

The system operational in Georgia and planned for other areas provides an option (bill check) whereby the consumer can decide each month when each preauthorized bill is to be paid, and how much should be paid.

To those knowledgeable in the EFTS area, the omission by Forbes of two key points is unfortunate. First, the strongest "moving" force today for the development of EFTS is not the commercial banking industry, but rather the Federal Reserve System. Secondly, the other half of the preauthorized charges story is that of preauthorized deposits. Examples here could include payroll checks, Social Security checks, etc. Advantages include security (avoidance of loss or theft of checks) and convenience (deposit of funds even though the individual is vacationing or otherwise unable to do this himself).

It is of the greatest concern to the banking community that any changes to the payments system, including those described, be optional to all parties, provide the safety and privacy so necessary when dealing with personal finances, and yield benefits to all parties, i.e., the individual consumer, the business firms and the banks.

James A. Schaf
Assistant Vice-President
National Bank of Detroit
Detroit, Mich.

A "moving force" from the commercial banking industry, from the Federal Reserve System, or from specialist consulting houses like Reistad's Payment Systems, Inc., is not enough. Nor is an awkward "stop payment" technique a match for the automatic Juggernaut. What is required at minimum is professional discussion of the various EFTS proposals in the specialist press, followed by popular expositions in the general media, before the consumer is irrevocably commited. HG

"He folded all the cards . . ."

Simulation System Stymied by Meeting Schedule

By Miles Benson
Special to Computerworld

Project Makehaste, like many projects paid for by the military arm of the Federal Government, had tight and binding deadlines. And Project Makehaste was managed by people who believed in meeting those deadlines.

Also like many projects paid for by the military, Project Makehaste was exceedingly complex. Its protagonists said it pushed the state of the art and was an intellectual challenge. Its opponents said it was simply infeasible.

Well, the jury is still out on the overall result. But along the implementation trail, at least one piece of the project fell by the wayside.

Way down at the support software nitty-gritty level, there were a bunch of interconnected modules which had to fit together to make things work. Not just fit together technologically, but fit together schedule-wise as well. Two of those pieces were a real-time executive monitor program commonly called RTMON, and a system simulator program called SIM.

RTMON was a typical hard-to-define, harder-to-implement, hardest-to-check out (yet at first glance simple) package of interrupt services and input/output managers and user interfaces designed to support the applications programs when they needed basic computer hardware services. The computer, as is typical in these situations, was a somewhat small, highly complex, special-purpose honed black box, and understanding its innermost workings was as difficult a problem as designing software for it.

SIM was an instruction level simulator . . . that is, a computer program whose function was to make one computer (known as the "host" computer) pretend that it was, in reality, another computer (known as the "target" computer).

For each instruction in the instruction set of the target computer, a subroutine in SIM would provide that service on the host computer. And for each input/output capability on the target, SIM would also provide a set of host instructions to perform that service.

RTMON and SIM had two vital things in common – both required absolute and complete knowledge of the most detailed level functioning of the Project Makehaste computer. And both had to provide input/output services for that computer.

The Project That Failed

The very existence of SIM, incidentally, indicates the seriousness of the scheduling problems of Project Makehaste. The chief reason for ever using an instruction level simulator is the lack of availability of the target computer.

Let's say Project Makehaste's computer is scheduled to be delivered in 30 months. Well, in 30 months you'd like not only to have that computer available, you'd also like some software working and checked out to drive it with. But how do you check out software on a computer you don't have yet?

Enter the instruction level simulator. You check out your software on the simulator, and if all goes well your hardware and its software are both ready to fire up at the same time. Now if scheduling weren't a problem, you'd get that computer in, *then* use it to check out its software, and the need for a SIM goes away. But that's not the way things were done on Project Makehaste.

Let's step down one more level into the complexity of the project. What level of input/output does SIM actually simulate? That is, does SIM simulate the handling of interrupts and input/output management? Remember, RTMON does those things. So why not let SIM, instead, simply simulate the user interfaces of RTMON? That is, in the input/output and interrupt areas, let SIM simply simulate RTMON, and not the hardware.

That approach had some advantages going for it. For one, it avoided forcing the SIM programmers to come to grips with the intricacies of modern computer interrupt capabilities. For another, it potentially allowed SIM to run considerably faster because it eliminated the simulation of all those machine level interrupt functions.

It did have one glaring disadvantage – the schedule. The design for the user services portion of RTMON would have to be rock-solid before the implementation of SIM could be completed. And the SIM schedule completion data lay considerably ahead of RTMON's on the Project Makehaste charts.

Well, the choices were clear. Project management, considering the potential good of letting SIM rely on RTMON, elected to gamble on the schedule problem. The specifications for SIM stated in the interface sections that SIM input/output services would be a functional simulation of RTMON, not a detail simulation of the hardware.

The inevitable happened. The RTMON people seemed to be in trouble from the start. The requirements were as stable as a tower of Jello. The design efforts shimmied and collapsed with each shake of the requirements base.

Like a football team after a bad series, a new manager was brought in to shore up the structure. With him, be brought his own ideas for program design. The whole project started over from ground zero.

And time was slipping by.

The clock ticked methodically on towards the day on the schedule when RTMON and SIM were to come together. SIM implementation, except for input/output, was proceeding full blast. RTMON efforts sputtered and chugged and fell back two steps for every three taken forward.

The day of reckoning came. When the last possible date for SIM input/output interfaces to be defined came, RTMON was just beginning the fifth and latest iteration of that interface definition. SIM could wait no longer. The latest RTMON interface was defined to be the one to which SIM would be built. The schedule allowed no other choice.

The only choice was also a bad choice. The latest iteration of the RTMON was no better than the ones before. RTMON changed the interface again . . . and again. But SIM was stuck there, unable to keep its changes current with RTMON and still meet its own schedule.

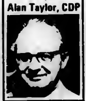
SIM was completed, but I'm not really sure why. It provided good instruction level simulation, and ran like a shot on the host computer. But its input/output capability was tied to an obsolete specification, and it was hopeless to use it for programs of any significance.

Schedules, I suppose, are a necessary way to run a railroad. But what do you do when one of your more important locomotives gets derailed? On Project Makehaste, they just kept right on going, on schedule . . . without it.

Insurability of DP Systems

FCC Approval of PCI May Have Good Side Effects

The Taylor Report
By
Alan Taylor, CDP



Spin-off is a well-known term, mainly connected with Nasa and the space program. Spin-off normally means the use of advanced technology in other often trivial areas. Now it appears that one of the most dramatic spin-offs to affect the computer field may have happened in the opposite manner, with a comparatively mundane technical activity – improving the efficiency of the use of telephone lines – suddenly appearing to be able to simplify data processing procurements and evaluations and even to help minimize the dangers of computer fraud in a way that is currently thought to be impossible, as well as improve communications itself.

Communication lines are currently operating at only 10% efficiency. The problems involve the use of "real-time" facilities. These facilities, although necessary for voice, are not necessary for data. In fact, using real-time lines seems a prime waste creator.

When a terminal is communicating with a computer over a real-time line, the transmission actually takes up 100% of the band width – no matter how little of it is used. By contrast, if batches (called packets in some cases) are used, then the efficiency of the line can be improved.

Each batch, as it is sent, can use the line at 100% efficiency. A supervisory management system controlling the scheduling of the batches can attempt to keep its own overhead down and its management efficiency up, so it can give better performance than the real-time communication system.

Naturally, under such a system, the line usage efficiency will only go up to 100%, if an infinite delay is allowed. The longer the allowable delay, the higher the efficiency. Packet Communications, Inc. (PCI), a Waltham, Mass., firm which has just received FCC approval to operate a non-real-time data communications network throughout the continental U.S., has settled for delaying the data for up to half a second. PCI believes this will more than double the efficiency of the telephone lines from the current 10% figure.

Faster, Cheaper Data

There are many things to be said in favor of the Packet Communications idea. It provides an improved data communication service at dramatic cost reductions. For instance, transmitting a 1.25M-character file, which currently costs $195 and requires nine hours of transmission time on the Bell System interstate system, or $66 and two to three hours transmission time on lease voice-grade private lines, would only cost between $20 and $40 using the new technology and would be completed within 20 minutes.

But the important part here is not simply in making data transmission cheaper; it is also in making it economical to connect many computers so data processing can escape once and for all the boundaries imposed by the first computer configurations. The traditional pattern of a computer – input, processing, storage and output – can now, whenever suitable, be broken.

The new pattern can consist of: Input connected to as many and as widely separated storages as are necessary, connected to as many processing facilities as are necessary, connected to as many outputs as are necessary.

It is easy to see some uses for the new configuration. For instance, if a computer procurement evaluation is under way, and the question arises as to what can be expected when a new operating system is used, it may be possible to use one of the other network computer systems to determine the figures without any great cost problems.

Similarly, in backup situations, providing some original preparations have been made, both capacity overflow and emergency back-up can become much more practical than they are under the traditional systems.

All these uses, to some extent however, are obvious consequences. What I am currently concerned about are the spin-offs – the items that come as "added value" to the system.

Insurability More Practical

The main spin-off is the insurability of data processing. After the recent Equity Funding scandal, the *Wall Street Journal*, in pointing out the lack of control on data processing, said there was no way in which a computer installation or an auditor could tell whether the program that was in use today was genuinely the same program used yesterday. Technically, of course, the statement was nonsense. There have for many years been methods of determining and controlling the use of programs.

Practically, however, the *Wall Street Journal* was correct. Few installations bother to try to control these matters thoroughly, and even fewer have made any successful attempts to do so. It simply is not normally economical for a single installation to provide the separate groups of experts that an effective control system needs, as well as the operational experts that the running system needs. The overhead of duplicated effort is too high – and the problems of coordination between the two teams are so great that the system often causes more problems than it cures!

Now, however, it looks as though insurability and control can become economical. The program itself can be stored in one computer and transmitted economically to the operation computer when the actual operation is in progress – but not before. Alternatively, at the end of an operation, the program and the job streams on the operational computer can be sent to some other outside control computer for comparison with standards, thereby making it practical to create a genuine operational audit trail.

These problems of lack of control and lack of security have already begun to seriously threaten the usefulness of data processing. It is possible that the real importance of the FCC approval of Packet Communications, Inc.'s service is in the widening of the facilities available to all users of data processing, including the ability to use the PCI network to solve many of the problems to which we have previously closed our eyes.

Of course, it is also possible PCI will do no such thing. Luckily, we will not have to wait very long to find out. One of the other revolutionary aspects of the new system is that in using already existing general-purpose computers and an already existing communications network, very little actual new hardware is required.

The network is expected to be put in operation within less time than many good sized applications take to be implemented. We are promised results in 1974!

So watch PCI – and any other networks that can offer equal facilities. They may have the answers to problems previously thought to be insolvable.

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Letters to the Editor

Let's Not Hand Freedom Over to Public Agencies

Re Harold Uhrbach's letter and *Computerworld's* reply in the Nov. 14 issue:

I do not find it at all an interesting possibility that an agency or consumer testing bureau could be created that would operate in a preventive mode, or that could at least check advertising copy for obvious flaws.

It is rather disconcerting to note the number of letters that come from readers recommending one form or another of control over their activities by some public agency. It has been my observation that between a parasitic congress and federal empire builders, their proclivity for encroachment into daily lives and business affairs in the form of protection hardly needs the support of those who would be the victims of this encroachment.

Secondly, I think CW should have rejected this proposal out of hand. That would be more consistent with the position CW has taken on press attendance at user meetings (with which I agree) and news media fear of censorship. We lose freedoms in little pieces and every little piece is worth hanging on to.

Those who shop in the computer marketplace are aware, or should be, of the infinite opportunities to choose the wrong vendor. We can all make mistakes, but those who do not investigate deserve the primrose path and the precipice at the end of it. Those who are new to the computer marketplace and don't investigate probably also add interest to their swimming activities by diving head-first into strange waters.

B.R. Barnes
Information Systems Manager
Glastron Boat Co.
Austin, Texas

Spin Coating Is Standard

The article in the Nov. 21 issue entitled "Electroplate In, Spraying Out as Means of Surfacing Disks" leaves the distinct impression that spraying is the standard industry coating technique. Nothing could be further from the truth.

Memorex, I believe, is the only disk manufacturer that spray coats its disks; the industry standard is spin coating.

Spin coating is the best technique for two reasons:

First, the centrifugal effect of the coating machine automatically aligns the cigar shaped oxide particles along radial lines before the solvent evaporates. The particular orientation is the most important specification in oxide coating technology.

Second, the coating centrifuge also causes a ramp effect – that is, the oxide coat at track "0" is twice as thick as the oxide coat at track "200." This ramp effect provides constant signal level for two reasons – the "self-induced air bearing" that the head "flies on" is thicker over the ramp, and the disk drives reduce read current at track 128 (2319) to compensate for the reduced oxide thickness.

Spin coating is preceded by a "clean and etch" operation which removes substrate manufacturing solvents.

After spin coating the substrates are baked, then buffed and washed, then burnished; the burnishing head shears off any protrusions one-half to one-third as high as the read/write heads will fly.

Frank P. Hogan
Memories Specialist
Control Data Corp.
Southfield, Mich.

Yes, I'd like to meet the ENTREX family of key-to-disk systems. Please tell me how we can get together and know each other better.
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And now we have even more to talk about. Our new System 280. It's ideal for the smaller user who needs only 1.8 million characters of intermediate disk storage and up to 8 DATA/SCOPES. Or the larger user who wants to perform remote data entry and communicate to System 480 or directly to the mainframe. Best of all, you can up-grade any time you desire, as all ENTREX systems are expandable by adding more disk capacity, more tape capability, even extra memory. Which means ENTREX systems are compatible . . . with each other . . . with your computer system. There's no generation gap in the ENTREX family!

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SYSTEMS&PERIPHERALS

Bits & Pieces

NCR 734 Converts Cassettes To Tape and Vice-Versa

DAYTON, Ohio – The NCR 734 will convert cassettes to magnetic tape or magnetic tape to cassettes, but is limited to use with the NCR 399 accounting series, NCR 270 financial system and the NCR 250 and 280 POS systems.

The unit converts the data from cassettes to either 7- or 9-channel, 1/2-in. magnetic tape. In reverse, it converts ANSI standard tape to NCR tape cassettes. These can then be used for report distribution or remote file updating.

Optional features include the use of up to three additional cassettes in the converter to expand its capacity. Memory is available in 8K increments, from the basic 8K to 64K. An NCR 260 thermal-printing data terminal can be used as an input/output writer.

The new conversion system including software is priced at $21,000 and rents for $580/mo.

Other Plotters for HP Calculator Use HP-Supplied Interface

LOVELAND, Colo. – For users who are not content with a Hewlett Packard-supplied plotter on their HP 9830 programmable calculators, HP has built an interface to enable attachment of other vendor's equipment. The 11282A interface, priced at $750, allows direct connection to Houston Instrument's DP-1, DP-3 and DP-7 plotters, as well as Calcomp Models 502, 563, 565, and Benson-Lehner Corp.'s 110 and 120 plotters.

2314-Type Drive for Minis

EATONTOWN, N.J. – The DD-23 single-spindle mass storage system from Diva, Inc. packs 58M, 8-bit bytes of data on an IBM 2314-type disk pack. A 2314-type drive provides an average access time of 32 msec, a transfer rate of 312 kbyte/sec, and a 90 sec start/11 sec stop. The system's controller is plug-in compatible with most 8-, 12- and 16-bit minicomputers and capable of controlling up to 8 disk drives.

The controller allows the drives to seek their individual addresses simultaneously, significantly reducing effective access time, the firm said. To maximize speed, data transfer and memory access are routed directly through the DMA channel where the highest rate of transfer is possible.

The purchase price of the system includes controller, disk drive, distributor panel, formatter and diagnostic software package, an in-plant implementation training course, and warranties. Unit price is $17,600 from Diva at 607 Industrial Way West ,07724.

Key-to-Disk Added To OCR Capability

NORRISTOWN, Pa. – The Scan-Data 2250/2 key-to-disk data entry system supports up to 32 keystations and offers programming flexibility including the use of Cobol procedure statements.

An optional conversion allows the user to integrate Scan-Data's previously announced 2250/1 OCR reader into the system to give multi-font and handprint data entry capability. This conversion to the 2250/3 system enables the reader to scan whatever data is scannable and to key in the other data to a file.

Simple parameter entries and Cobol procedure statements are used in programming the 2250/2 system, and the standard software allows local and remote keystation users to search, update and process data files, the firm notcd.

Up to 32 keystations can be supported on the Scan-Data 2250/2 data entry system.

480 Characters

The Scan-Plex II key entry CRT station displays up to 12 lines of 40 characters; three keyboard formats are available – standard typewriter, keypunch or keypunch/adding machine.

The 16-bit (plus two parity bits) word minicomputer control unit has a cycle time of 1.25 msec and the memory is expandable to 64K with all words directly addressable, according to the company.

Up to four magnetic tape units can be included on a system in any combination of six available models – in either 7- or 9-track format.

The standard disk with up to 2.2M bytes of storage is removable and has an average access time of 35 msec. A second model is available with 4.4M bytes on two platters but one is not removable.

Program Sequence Alterable

Each job can have up to 32 automatically sequenced program levels and the sequence of execution is alterable either by the entry operator or by the program in response to data entered.

Each batch has available up to 99 arithmetic registers for Cobol arithmetic operations, up to 99 balance registers for automatic crossfooting and totaling, up to 99 character registers of up to 120 characters for character manipulation and storage, and up to 99 auxiliary duplication registers for emitting constants.

Any of these registers is instantly displayable by the operator without disturbing the data in the body of the display. Forty procedure language verbs are available.

The Scan-Data 2250/2 will be available during the first quarter of 1974. Cost for an eight-station system is $1,985/mo including maintenance on a three-year lease. There is a one-time charge for conversion to a 2250/3 of $3,000 plus a new lease. An eight-station 2250/3 with single font capability leases for 6,875/mo on a three-year lease.

The company is located at 800 E. Main St., 19401.

Byte/Gallon?

Compute Your Oil Consumption

By Vic Farmer
of the CW staff

While the country faces a massive oil crisis, many DP managers have probably been sitting back in their chairs thinking: "At least my trusty old computer runs on electricity . . . the oil crisis won't affect it one bit."

Well guess again. According to Boston Edison Co., it takes .071 gallons of fuel oil to generate one kilowatt of electricity for one hour.

So that big 370/168 with 4M bytes, full-boat 3330s and a small assortment of tapes, printers and other sundry peripherals – plus the necessary 40 to 50 tons of air conditioning equipment – is gobbling up 17.2 gallons of fuel oil an hour, and running it around the clock is consuming 412.8 gallons a day. *

Fortunately, not everyone has a 168.

Here's a quick formula for finging out how many kilowatt-hours your center uses and how much oil it takes to generate this electricity.

First find out how many kilowatts your CPU uses, add consumption for tapes and disks, and double this total to take care of air conditioning, lighting and "fudge factor."

Next multiply the total kilowatts times hours to get kilowatt-hours, and then multiply by .071. The result is the approximate consumption of fuel oil.

Here are some rough power consumption rates per hour for selected IBM mainframes with average-sized memory:

System 3/10 uses 4.5 kW; 360/20, 8 kW; 1130, 5.5 kW; 360/40, 16 kW; 370/135, 38 kW. A 370/168 with 4M bytes uses 97 kW.

For Honeywell equipment, a Model 58 with 5K bytes (8-bits) uses 720 kW: a 115-2 with 65K, 4.3 kW; a 200 with 32K, 3.4 kW; a 2070 with 1M bytes, 6.7 kW; and a 6000 with 32K, 8.5 kW.

An NCR Century 100 with 16K, I/O writer, card reader, printer and disk uses 4.5 kW; a Century 200 with 64K, I/O writer, card reader, disk controller, printer, two disks and card reader/punch, 12 kW; and a Century 300 with 256K, I/O writer, CRT printer/controller, disk controller and two disks, tape controller and four tape drives, and card reader/punch, 30 kW.

A Xerox 530 with 32K, second I/O processor and teletypewriter consumes 2.2 kW.

For CDC, an average 1700 system would use 13 kW, a 3170 would use 45 kW, and an average Cyber 70/74 would use 160 kW.

Average electricity consumed by Univac systems is: 9200, 11 kW; 9400, 26 kW; 90/60, 32 kW; 1110 1X1, 65 kW; and 1108, 93.5 kW.

Tape drives for all equipment average about 1.5 kW per unit; disk drives average about 1.5 kW per spindle.

Microcode Improves HP's Fortran Speed

CUPERTINO, Calif. – Improvements in Fortran execution time by factors of two to 28 can be attained on Hewlett-Packard 2100 minicomputers with the HP 12907A Fast Fortran Processor (FFP), according to the firm.

Twelve of the most often used Fortran subroutines are implemented in 196-nsec microcode with the 51,250 plug-in package.

The FFP empowers double-precision floating-point arithmetic operations as well as the most frequently used address and control transfer functions.

The HP 12907A can be installed in the field on the HP 2100A and 2100s. The FFP includes a relevant program for HP DOS-M and DOS-III operating systems, and a diagnostic.

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Automatic Line Length Control Used by Printer

COSTA MESA, Calif. – A 100 char./sec bidirectional serial matrix impact printer introduced by Trivex, Inc. incorporates an automatic line length control.

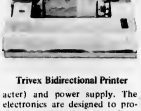
The Model 700 printer prints 132 character line using a 7 x 9 dot matrix. Printing is bidirectional with the head traveling left-to-right and reversing its direction for the next line.

When the printer prints the last character of the first line left-to-right, the second line is loaded into a 132-character buffer. The head then moves to a position just beyond the last character of the second line, performs a line feed operation, and prints right-to-left.

The paper-handling mechanism is a pinfeed, tractor-type system with adjustable sprocket spacing. A paper runaway inhibitor and "paper-out" and "paper-tear" shutdown are included. Vertical format control is accomplished through the use of two channel paper tape.

Three models are available: the models 710 and 720 are complete self-contained units. They include all mechanical hardware, electromechanical components, character font generator, control logic, 132-character line buffer (synchronized for each character) and power supply. The electronics are designed to provide complete interface flexibility. Prices start at $2,600.

The Model 700 is offered with complete mechanical and electromechanical hardware. Electronics must be supplied by the customer and prices start under $1,000 from the firm at 3181 Red Hill Ave., 92626.



Trivex Bidirectional Printer

HP Delivers Disk Unit

CUPERTINO, Calif. – A disk-based system consisting of the HP Series 2100A computer and the HP 5M-byte disk subsystem is now offered by Hewlett-Packard at a lower price than the combined cost of the individual modules. The complete HP 2123A hardware package, with a 16K memory, has a single-unit OEM price of $20,825 as compared with $24,225 for modules when bought separately.

Floppy Standard?

WASHINGTON, D.C. – The X3 Standards Planning and Requirements Committee (X3/Sparc), at its November meeting, established an X3 Study Project to determine the suitability of flexible disks for standardization. The study group, to be chaired by Paul Green of Control Data, is charged with determining the technical and economic justification for standardization.

Individuals or organizations interested in participating should contact the X3 Secretary, CBEMA, 1828 "L" St NW, 20036.

OEM Products

(While equipment in this column is primarily for Original Equipment Manufacturers (OEMs), in most cases it is also available in single units to interested users.)

Facit 4020 Tape Reader

Facit-Addo Adds Paper Tape Unit

SECAUCUS, N.J. – Facit-Addo, Inc.'s table-top/rack-mount paper tape reader uses a light-emitting diode as the light source, and as a result, the Facit 4020 can read tapes that are up to 80% transparent.

The reader tolerates 6% spacing errors and operates at speeds up to 300 char./sec, and requires no lubrication or special adjustments, according to the company.

The basic price is $1,050 from the company at 501 Winsor Drive, 07094.

BEYOND SMF QCM

Quantitative Computer Management (QCM) is a comprehensive resource management and job accounting system for IBM data centers.

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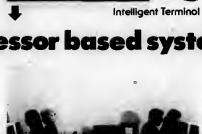
Datapoint 1100 processor based systems

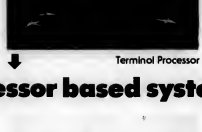
Remote Batch Terminal



Intelligent Terminal

Datapoint 2200 processor based systems

Remote Job Entry



Terminal Processor

Datapoint 5500 processor based systems

Local Processor

Remote Processor

The pictures indicate a typical growth pattern of 1100 2200-5500 usage as a field office's work load increases. In the left-hand column, normal progression begins with the Datapoint 1100 for Remote Batch Terminal applications. In this mode, card readers, tape units, communication equipment, and printers are utilized as peripheral devices for efficient transmission of data between the remote location and host computer. In the second phase, the Remote Batch Terminal operation is upgraded to a 2200 to provide stand alone processing power to expedite Remote Job Entry applications. In addition to the expanded processing power of the 2200, disk capability and RMS 8 substantially enhance the effectiveness of the 2200 used in this way. In the third phase, a stand alone Datapoint 5500 is utilized as an independent Local Processor to meet all the dispersed processing requirements at the remote site without relying on a central host facility.
In the right-hand column, the first picture shows the Datapoint 1100 used as a powerful Intelligent Terminal for data entry and limited processing tasks. In the next phase, field office needs have grown to an intelligent multi-station requirement and are satisfied by the Datapoint 2200 used as a Terminal Processor. In this mode, a single Datapoint 2200 can provide "intelligence" for up to eight keyboard/display stations with subsequent transmission of data between the host and remote sites. The final progression is to the Datapoint 5500 Remote Processor, used in field offices as local "computer utilities," still linked to the host processor system, but now providing substantial independent compute power of their own to an array of peripherals and terminals located in the field offices.

Data Disc Graphic Display System Interfaces With CDC 1700 Computers

SUNNYVALE, Calif. – Electronics necessary to interface CDC 1700 computers and the Data Disc 6600 television display system have been introduced by Data Disc, Inc.

The 6600 uses low-cost television monitors in as many as 16 independent terminal locations, the firm said. Color TV monitors may be used for displays showing seven colors plus black and video channels may be combined for form overlay or protected data displays. Gray scale capability is available at four or 16 levels which, when used on color monitors, can provide up to 4,095 colors.

Over 250,000 individually addressable display points can be used to make up the graphic display. The alphanumeric capacity is 3,200 on-screen characters. The character entry rate is 30 page/sec.

A 16-terminal system with video generator, refresh disk, a CDC 1700 computer interface, a 14-in. TV monitor, a keyboard and a keyboard interface to the computer costs about $5,900/terminal.

Delivery is 90 days from 686 West Maude Ave., 94086.

It's Safe

The Diebold One-Hour Data Safe is designed to protect disk packs, tapes, microfilm, microfiche and other media. It costs $1,693 from Canton, Ohio 44711.

Emulator Links OCR, IBM CPUs

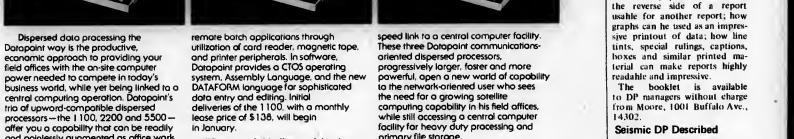
BEDFORD, Mass. – ECRM, Inc.'s CX paper tape reader emulator interface connects its 5000 series OCR data entry systems directly on-line to IBM 1130, 1800 and 360 computers.

The interface generates exactly the same output as a CX paper tape reader and is designed to plug into the reader connector plug available on IBM and other typesetting systems.

The interface is priced at $2,500 and includes electronics, connectors, power control, power supply and ventilation.

ECRM is located at 205 Burlington Road, 01730.

Dispersed data processing the Datapoint way – as easy as 1100-2200-5500



Dispersed data processing the Datapoint way is the productive, economic approach to providing your field offices with the on-site computer power needed to compete in today's business world, while yet being linked to a central computing operation. Datapoint's trio of upward-compatible dispersed processors – the 1100, 2200 and 5500 – offer you a capability that can be readily and painlessly augmented as office work load increases, as your company's communications network becomes more sophisticated and your field office personnel more knowledgeable.

Let's look at these processors: the Datapoint 1100, available with 4K or 8K central memory, is the new Intelligent Terminal system from Datapoint Corporation that can bring your field offices into the on-line computer age immediately. Competitively priced, and with extensive capability for business processing tasks such as on-line (or off-line) data conversion and entry, it is a basic building block for creation of a multi-use dispersed data processing and data handling capability in your field offices. Once installed, the 1100 can do double duty for progressively more sophisticated data processing and data communications assignments including remote batch applications through utilization of card reader, magnetic tape, and printer peripherals. In software, Datapoint provides a CTOS operating system, Assembly Language, and the new DATAFORM language for sophisticated data entry and editing. Initial deliveries of the 1100, with a monthly lease price of $138, will begin in January.

When your field office work load grows beyond the capability of the 1100, it is an easy, painless transition to a more powerful Datapoint processor, without the need for jarring systems redesign and expensive software revision. The secret is in the upward compatibility of the 1100 with the well-established Datapoint 2200 Terminal Processor and the new Datapoint 5500 Remote Processor. It is as simple as pulling the plug on the 1100, plugging in the 2200. No complex systems changeover, no costly software rewriting is entailed: the user obtains the needed increment in dispersed data processing power in his field offices without disruption. The 2200, a widely used and well-established system with up to 16K central memory and dual ECMA standard cassette drives, will do everything the 1100 will do, and also provide an expanded on-site computer power. In a multi-station mode, it can service up to eight low-cost terminals for data entry and related tasks.

The 2200 is a natural step towards the 64K Datapoint 5500 Processor (deliveries in third quarter, 1974), which will do everything the 2200 does and also constitutes an on-site "computer utility" in your field offices. This system will provide computer power for a large number of associated peripherals and for a variety of low-cost, non-programmable terminals while simultaneously furnishing a high speed link to a central computer facility. These three Datapoint communications-oriented dispersed processors, progressively larger, faster and more powerful, open a new world of capability to the network-oriented user who sees the need for a growing satellite computing capability in his field offices, while still accessing a central computer facility for heavy duty processing and primary file storage.

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Books and Brochures

Meet the Minis

Computing With Mini Computers, by Fred Gruenberger and David Babcock; John Wiley & Sons, Inc., New York; 288 pages, $11.95.

Designed as text in computing for a one-semester college-level course, this book is a basic introduction to minicomputer use.

The text is not all-inclusive and, in fact, calls for procuring a mini system operating guide in an early chapter.

Mini architecture discussions are directly related to software constraints and techniques.

Booklet Has Testing Hints

NIAGARA FALLS, N.Y. – In many companies, "in-house" reports are often the only forms seen by a company's management, and often help decide management's opinion of its data processing operations. A 16-page booklet, "Internal Reports – How to Make Them More Economical, More Impressive, More Readable," has been issued by Moore Business Forms as an aid to DP managers.

The booklet shows methods and ideas by which one form can be used for four reports; how carbon strip patterns can make the reverse side of a report usable for another report; how graphs can be used as an impressive printout of data; how line tints, special rulings, captions, boxes and similar printed material can make reports highly readable and impressive.

The booklet is available to DP managers without charge from Moore, 1001 Buffalo Ave., 14302.

Seismic DP Described

FORT LAUDERDALE, Fla. – How the power and versatility of 32-bit real-time minicomputer systems can be used for geophysical data processing is described in a 24-page brochure now available from Systems Engineering Laboratories, Inc.

The mini systems described serve as satellites to a central data processing facility or perform as stand-alone systems for seismic data reduction. Several configurations are illustrated and discussed in the brochure.

For a copy of "Seismic Data Processing," write to Communications Department, 6901 West Sunrise Blvd., 33313.

Educational Uses Illustrated

PALO ALTO, Calif. – A 32-page brochure describing a variety of computer solutions for instructional, administrative and research problems of colleges and universities is available from Hewlett-Packard Co.

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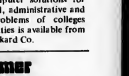

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COMMUNICATIONS

Data Briefs

MSI Offers Hand-Held Device For Batch-Type Data Entry

COSTA MESA, Calif. – MSI Data Corp. has added a hand-held unit to the lower end of its line of field data entry terminals.

The Source 1100 terminal is a 16-key device that stores data for batch-type transmission over voice-grade lines at 40 char./sec.

Memory capacity is optional with either 2K, 4K or 8K characters, the firm stated. A battery pack provides power and there is a recharger in the detachable acoustic coupler.

A Source 1100 terminal with one-digit display, 2K memory, error control such as double key detect and field check length, low memory indicator, low battery indicator, automatic header and acoustic coupler costs $900 with delivery in 90 to 120 days from the firm at 340 Fisher Ave., 92627.

Gandalf Adds Controller

OTTAWA, Ont. – Gandalf Data Communications has introduced a multidrop network controller for use with the firm's LDS 700 line of local data sets.

The Model LDS 2000 controller eliminates the need for bridging circuitry and simplifies diagnostic procedures, according to the firm.

The controller would cost $3,400 for a multidrop network with eight terminals running onto one computer port, a Gandalf spokesman said.

Delivery is six to eight weeks from the firm's U.S. distributor, Penril Data Communications, 5520 Randolph Road, Rockville, Md. 20852.

Datapoint 2200 Gets Disk

SANTA ANA, Calif. – Standard Logic Systems, Inc. has introduced a disk system for use with the Datapoint 2200 Processor. The system MDP-8 offers from 2.5 to 20 Mbytes of on-line storage. The MDP-8 incorporates an interface, formatter and random access, cartridge loaded disk drive.

The interface contains an MOS memory sector buffer which holds up to four sectors of 256 bytes each of data.

The unit is plug-to-plug compatible with disk subsystems offered by Datapoint, and operates under Datapoint DOS software, No additional programming is required.

Prices start at $9,750 with delivery in 30 days, from 2215 S. Standard Ave., 92707.

Correction

Datran [CW, Nov. 28] is an acronym for Data Transmission Co., the specialized carrier based in Dallas and Vienna, Va.

Tester Spots Terminal 'Streaming'

MCS Combines Modems, Diagnostics

By Ronald A. Frank
Of the CW Staff

BURLINGTON, Mass. – Prototype diagnostic equipment now operating in a system test environment could change the way communications users buy modems. At least that is what Intertel, Inc. is hoping.

The firm is beginning to install its modem communication systems (MCS) at firms that need constant control over their multipoint, multidrop private line networks. The MCS concept combines both modems and diagnostics into integrated equipment consoles.

The latest addition to the MCS line is the MPT-500 multipoint tester which is used in conjunction with MP-750 remote site modules installed at field sites in a user's network. By using the MPT-500 at central sites, users will be able to isolate faults and make required maintenance decisions from one location, Intertel believes.

When configured into a network, the MPT-500 allows the user to test up to 12 multipoint lines with up to 40 drop/line. The tester can locate and stop terminal "streaming," measure and display error rates, and perform other troubleshooting routines, without taking the network off-line, a spokesman said.

The tester uses out-of-band frequencies and transmits diagnostic signals at 75 bit/sec to the remote sites and receives test results back at 37.5 bit/sec. The MPT-500 can switch to spare modems at remote sites and can control line switching between dial-up and normal private lines, all from the central site.

The MPT-500 costs about $225/mo and the MP-750 costs about $16/mo on two-year leases. The units are available as part of MCS configurations which are tailored to the user's needs and include modems, as well as the diagnostic equipment. Available modems include Bell-compatible 1,200-, 2,000- and 2,400-bit/sec units.

User Saves

One user of the MCS equipment, who preferred not to be identified, said he had saved significantly on communications costs by switching from Bell data sets to an Intertel system.

The user's company has a national private-line net with 150 201 data sets, operating an order inquiry-type application. This equipment was replaced by 105 Intertel modems together with the MPT-500 tester and other equipment such as modem sharing devices which allow multiple terminals to use the same data set.

The monthly network costs with Bell were about $27,500 and this dropped to $21,000/mo or more than $6,000/mo less even with the additional testing capabilities, the user said.

The user said the Intertel ability to spot terminals in a streaming mode was unique to his knowledge. He said the condition is caused when a terminal's Request-to-Send signal would come up and stay up. This situation was quite prevalent in the older Bell configuration and is a problem for most full-duplex private-line users, he said.

Data Translator Aids TP Users

PORT WASHINGTON, N.Y. – Software Creators, Inc. has introduced a translator package which serves as an on-line message translation system for 360/370 users.

Called Telecommunications Translator (TLT), the software is said to "relieve the user of all programming, testing and debugging required to turn words, phrases and data contained in screen messages into information that a TP system can process."

TLT, written in Assembly language, is modularized, nearly reusable and will run under "any of the 360/370 standard operating systems" including DOS, OS and VS, the company said. The on-line module operates as an applications program in the user's teleprocessing system. TLT links up with TP monitors such as CICS, Task/Master and Minicom through customized interfaces.

The translator requires no modifications in the user's existing applications programs and it operates as a called external subroutine in the applications programs, the firm said.

The user can code CALLs to the TLT module in any of his Cobol, PL/I or Assembly language processing programs whenever there is a message to be translated. Any of the words and phrases the user puts in a specification can be used as a question, statement, command, etc., without special programming or coding. The specification is a free-form list of words, phrases and data.

The specifications are entered from the CRT terminal and in the event of errors, the translator returns diagnostics to help the operator. The user can develop his specifications on-line or off-line. When operating off-line, it is possible to test the specification with sample card-to-printer messages before going on-line. TLT will process any number of statements in the same message.

The translator requires 4K of on-line storage which coincides with the size of a VS page, according to a spokesman. TLT performs no I/O of its own and it normally executes at mainframe speeds. It is most useful for IBM 2260 or similar terminals including but not limited to displays supplied by Hyle, Hazeltine and Bunker-Ramo, the spokesman added.

TLT is available on a four-year lease/purchase plan with maintenance updates. The user can get a 30-day trial period before paying $200/mo for the system. The firm is at Four Seagull Lane, 11050.

Two Bell Companies File Model 40 Rates

NEW YORK – As part of the Bell System policy of meeting competition in the data communications area, various tariffs have recently been established or proposed by AT&T telephone companies.

Two of the first intrastate tariffs for the Bell System Dataspeed 40 have been filed by AT&T operating companies in Iowa and Minnesota.

The Iowa rates took effect on Oct. 11, according to a regulatory commission spokesman, and range from $110/mo to $185/mo for the terminal depending on options. Installation ranges from $125 to $150.

The Minnesota rates cover about the same range, according to a state spokesman, who said the rates had gone into effect on Nov. 1. A keyboard display with printer costs $180/mo with $150 installation charge in both states, AT&T said.

In the interstate services area, Bell filed rates for its high/low density private line proposal to take effect on Jan. 15. The rates for the service are essentially the same as those filed earlier this year by AT&T, and are designed to compete with rates being offered by the specialized carriers in high-density (metropolitan) regions. Low-density (rural) users will pay more.

One user reported that Bell is planning a tariff change that would eliminate the need for C-2 conditioning on private lines used with AT&T's 200 series data sets. But an AT&T spokesman said he had no knowledge of this change. Another change now allows interstate users to utilize four-wire circuits for half-duplex applications without requiring them to pay full-duplex rates.

AT&T also is expected to file rates soon for its Dataphone Digital Service (DDS) scheduled to begin operation between New York and Boston early in 1974.

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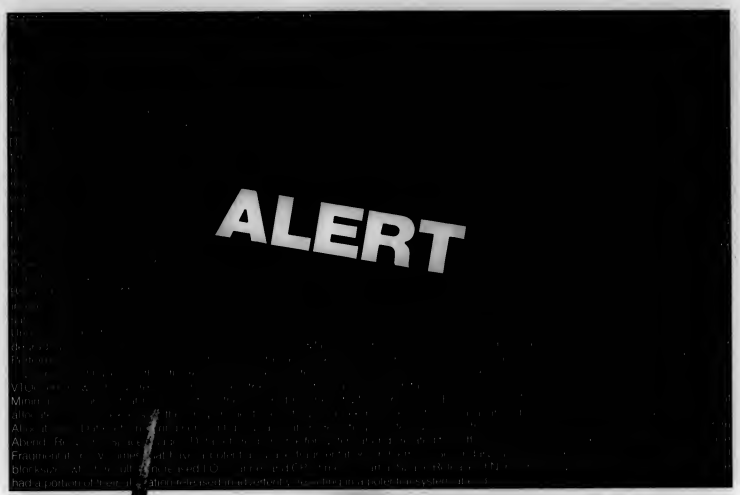

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SPCC Ready to Expand Into National Carrier Net

SAN FRANCISCO – Southern Pacific Communications Co. (SPCC) is expanding its specialized carrier services into a national network. Originally operating on the West Coast and in the Southwest, SPCC has acquired Video Microwave, Inc., a former specialized carrier which had planned to operate between New York and Boston. In addition, SPCC is now planning to take over the specialized carrier network of United Video, Inc., officials said.

Southern Pacific also has existing agreements with Western Union for both land facilities and channels on the Westar satellite expected to become operational next spring.

With its latest network expansions, SPCC plans to provide service on a coast-to-coast basis as early as March 1974. The current service schedule includes connection of the first data customer between San Francisco and Tucson, Ariz., in December. Final systems tests on this route are now in progress. Service from Dallas to Tulsa is expected by mid-December.

In January 1974, SPCC expects to begin service to customers between Tulsa and St. Louis. The Dallas-to-San Antonio link will be ready by Feb. 15, and users can expect service from San Antonio to Tucson by April. The Boston-to-New York route is scheduled for operation in the spring of 1975, a spokesman said.

NCR Adds Hospital Unit

DAYTON, Ohio – An intelligent on-line data terminal for hospital nursing stations has been introduced by NCR.

The 275-200 hospital terminal is a programmable countertop unit for data entry and communication with hospital-wide computer systems, according to a spokesman.

NCR has supplied approximately 20% of the computer systems in use today in the nation's hospitals, the spokesmen said.

The terminal provides a means of recording and expediting instructions given by doctors for the treatment of their patients. Each terminal is linked to the hospital's central computer which acts as a clearinghouse and storage point for doctors' orders. The computer routes the instructions to the proper hospital departments for action, at the same time maintaining records for later accounting needs.

Because of its self-contained logic and programming, the NCR 275-200 terminal is not entirely computer-dependent. It can recognize check digits, perform calculations and guide the nurse in entering the required information in its proper sequence.

The new terminal interfaces with NCR Century 101, 200, 251 and 300 computers and also those of other manufacturers.

Most of the information is entered into the terminal with a data wand. The wand reads bar codes identifying the patient, the service order, any special instructions and the operator. Unique special instructions not encoded can be keyed into the terminal.

The terminal has three separate printers. One produces a journal tape which can be removed only by supervisory personnel. A second prints on an inserted form which may be used for verification or reference. The third prints messages received by the terminal while it is unattended. All three printers operate at 32 alphanumeric char./sec.

The nursing terminal costs $5,845 including the data wand. It rents for $182/mo. Deliveries will begin in the second quarter of 1974.

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Along With Text
Terminal Gains Plot Mode

LOS ANGELES – Camera-ready graphics can be interspersed with tabular reports or text produced on a GSI 300 universal data terminal attached to various mainframes, by using plotting software being distributed free by Gen-Com Systems, Inc. (GSI).

The package is written in Fortran IV, runs on Burroughs and IBM CPUs and is being adapted to other machines. It is generally compatible with Calcomp's plotting routine CALLs. Differences are minor, GSI said, noting – for example – that on the new unit the X-Y axis is the inverse of Calcomp's.

While Calcomp plots graphics with special equipment, GSI prints its output – graphic and non-graphic alike – using characters from its normal print wheel, a Diablo "daisy." GSI 300 is a general-purpose unit that can be switched in and out of plot mode through entry of control codes.

With the facility to print in any direction, the unit plots as data is being analyzed, GSI stressed, whereas terminals with more conventional print mechanisms the host CPU. Source code and a manual with sample user programs are available without cost to GSI 300 users.

The terminal itself can be leased for $155/mo, or purchased for $3,950, from 1545 Wilshire Blvd., 90017.

often require the development and storage of the entire figure to be plotted before output can be produced one line at a time.

Plots generated on the GSI 300 would normally use the period as the graphic character but users can designate any character on the print wheel as the desired output symbol. This would be particularly useful, a spokesman suggested, in cases where two or more lines are being plotted.

The plot support software requires less than 8K storage on

DP Staffs Can Be 1000% Better In Right Setting, Meeting Told

By Don Leavitt
Of the CW Staff

NEW YORK – Many observers have noted that a "fully professional" approach to software development can produce "enormous improvements" in productivity and responsiveness of the programming function, but Conrad H. Weisert, senior consultant at Martin-Marietta is more specific.

He told a recent management conference, "When all the factors are added together . . . these improvements may be as great as a factor of ten; i.e., five programmers can do the work of 50."

"Professional" is an overworked word, he admitted, but sometimes it is appropriate. And it is important to recognize the complementary requirements of a professional staff and a professional environment in which the staff can operate, he added.

"The most valuable professional you can have on your staff at the beginning is the one who can reliably recognize talent and achievement in others," Weisert said in summing up the people problem.

Maximize Skills

A professional environment, he went on, supports the professional staff by maximizing the effect of their specific skills and abilities and by minimizing redundant or duplicate activity. Prerequisite to a professional environment is a firm management commitment to disciplined, orderly planning and activity.

The first element of such an environment is a methodology for program and file design based on modular organization. "Modularity" is another overworked word; most data processing organizations claim to practice it at some level, the consultant agreed, but only a few know what it really means:

- Every attribute or parameter of the application or of the computer environment is defined in only one place in the program.
- Each module (section, block, subroutine, etc.) of the program performs one well-defined program function, and only one.
- Modules depend upon each other only through explicitly defined interfaces.

A program that is not modular is called "monolithic," he noted.

Many program modules can be used again in other programs and projects. To exploit this, he urged, establish as the second element of the professional environment a library for storing and distributing modules. This library must be carefully controlled and supported to assure that:

- A programmer can determine if a particular kind of module exists, obtain a copy of it and learn how to set up his interfaces more easily and quickly than he could develop a comparable module himself.
- Programmers and programming managers throughout the organization are strongly encouraged to contribute useful new modules.

Quality control assures the accuracy and completeness of contributed programs and documentation.

The third element of a professional environment, according to Weisert, is a set of programming standards. Professionals will naturally tend toward modular organization, but their contributions to the library, good as they are in themselves, will be useful to others only if the specified interfaces are sufficiently compatible with one another. Among the specific areas these standards should cover are programming language, data representation, file organization and programming techniques (e.g., data validation, error handling, table construction).

The question of whether to adopt a uniform methodology or pluralistic methodologies for software development is answered, Weisert noted, when the choice is made between a professional and a non-professional approach.

One might at first worry that the professional staff will resent the "imposition" of standards as inhibiting their creativity and object to a library of prewritten programs as "taking the fun out of programming," he said, but this fear is groundless. No true professional finds satisfaction in doing the same sort of thing over and over year after year. There are so many really interesting new problems to solve, that our professionals will welcome these standards as a relief from trivia, he added.

'Forth' Backs On-Line Use for Minis

TUCSON, Ariz. – Users of 16-bit minicomputers can write on-line programs that run "much faster" than programs in conventional high-level languages and that "may use less memory" than assembler coding, with the Forth language processor from Forth, Inc.

The processor, which allows the user to write his own vocabularies, has been implemented on DEC, Data General, Hewlett-Packard, Honeywell, Modcomp and Varian minis. Forth includes a complete operating system independent of any control software the mini hardware may provide.

The new language uses what the firm describes as a "unique combination" of interpreter and compiler techniques to add efficiency to both program generation and execution. It also includes support for multiprogramming and the use of tapes and disks as virtual main memory.

The interpreter-compiler approach allows the system to interpret and then encode newly desired functions if defined in terms of vocabulary already stored in 1,024-character text blocks. Functions already defined are converted to what is essentially object code for later high-speed execution.

Access methods within Forth create virtual memory operations on conventional tape or disks, without special address-handling hardware. All peripheral memory is accessed on a random basis and the I/O buffer management makes currently required data available without the user being aware of the transfer mechanism, a company spokesman claimed.

In multiprogramming mode, the system can handle one or more tasks in 8K, depending on their complexity. Many Forth routines are reentrant so most of memory is shared in the multi-user environment.

Forth is being adapted to more minis beyond the current range of implementations. The basic package costs $2,000, plus a $1,000 installation fee for on-site instruction and support.

The firm is at P.O. Box 4685, 85716.

CDP Prep Planned

WASHINGTON, D.C. – DP professionals in the Washington area can make their installations and their own work more effective, and prepare for the forthcoming CDP examinations, by attending a seminar offered by Compudemics.

The sessions will run from January 5 through February 9, and the entire course will cost $475, the company said from 1629 K Street, N.W., 20006.

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User's Package Ties System/3, 3270 for On-Line Order Entry

WHITE PLAINS, N.Y. – Users who need current information about orders and customers, but are able to handle most of their DP needs on a small CPU, can couple an IBM System 3/10 and 3270 display system terminals with an on-line order entry system available late this month as an Installed User Program (IUP) from IBM.

The IUP provides on-line order entry via the 3277 display stations, and order processing including preparation of the invoice and shipping documents. The package also manages a back-order file to facilitate application of receipts to stock.

Logic built into the system backs on-line inquiry and application of cash receipts into the customer file. The IUP also generates daily sales reports and transaction data necessary to update accounts receivable files.

The order entry module allows up to four price breaks for quantity or two additional prices by customer class. The system can, via a special screen, allow the operator to enter a special price negotiated between the user and customer.

Information accessible through the inquiry routines includes credit limit, date of last invoice, date of last payment and date of last maintenance on the record itself.

The new application package requires a 32K S/3/10, and operates under release 8 of DSM.

As an IUP, the new package is available for a monthly fee – as are program products – but the fee is waived after the first 12 months of use. Maintenance of the package is also limited compared with the support IBM provides for its program products; error fixes are reported in newsletter format and even then, only for the first six months after first release of the IUP.

The entry system itself costs $375/mo for the first 12 consecutive months of use.

IF THE IBM 3270 HAD INTELLIGENCE, IT WOULD BE A SYCOR 250.

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Because, while our new Sycor 250 does everything IBM's 3270 does and more, its monthly lease cost is lower.

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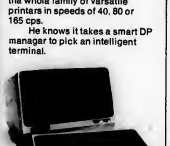

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Links to IMS, Total Extended in Mark IV

CANOGA PARK, Calif. – Mark IV users may gain improved access to subroutines and to data base systems, with special features in the 15th release of the file management system from Informatics, Inc.

The Extended Segment Processing feature gives full subroutine capabilities and extends Mark IV's branching operations. It also protects against undesired looping and provides access to selected elements in files under IBM's IMS, Cincom Systems' Total and other data base handlers.

Even closer ties with Total are possible, however, through use of the Data Base Retrieval/Total feature. This supports retrieval and reporting from Total data bases, but also allows creation of standard operating system format subfiles from Total data bases.

The Data Base Retrieval/IMS provides the same type of support for data bases built with the IBM system support. In addition, improvements in the Data Base Interface/IMS feature expand Mark IV's capabilities to access any data base structure, regardless of the logical record size or number of segments, Informatics said.

Mark IV is packaged in various ways depending on the features required, but costs from a minimum of $7,900 to a maximum of $37,000. The new special features are separately priced, the company noted from 21050 Vanowen St., 91303.

Free Card Aids TIP Work

HACKENSACK, N.J. – A free pocket-sized reference card from On-Line Software, Inc. helps systems and applications programmers working with the Transaction Interface Package (TIP) monitor system on Univac 1100 series CPUs.

The card illustrates Slop table layouts, Compool record formats, ER Values and other specific details of TIP usage that are helpful in debugging. It may be requested, in reasonable quantities, from 411 Hackensack Ave., 07601.

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LEAA Official Claims

Criminal Justice Systems Are States' Responsibility

By Toni Wiseman
Of the CW Staff

CHICAGO – "It is the LEAA's philosophy that the responsibility for operating criminal justice systems is not a federal responsibility but [one which] is constitutionally reserved for the states," said George E. Hall, acting assistant administrator, National Criminal Justice Information and Statistics Service, Law Enforcement Assistance Administration.

At a recent criminal justice symposium here, Hall said, "The justice process is the oldest social system and yet people know very little about how it operates, and how little information is available to those trying to operate it. I suspect that in criminal justice, more paperwork is involved to less effect than in any other system."

There is a need for planning in all areas of criminal justice, he said, adding that the courts operate "very much in a green eyeshade and quill pen manner."

In an effort to solve the dilemma, the LEAA has begun to examine programs ranging from the simple recording of crimes to very sophisticated telecommunications networks, Hall said.

National Data Bank

To begin with, a national data bank is needed, he said, but the problem is how to go about it. Statistics, both aggregate and individual, need to be an integral part of the system, both for planning and for evaluation. To that end, LEAA, through its Comprehensive Data Systems program, is providing funds to state and local agencies to develop a statistical base for program development, management and evaluation.

Hall outlined the steps which LEAA requires each state to take before being allowed to participate in the program.

First, he said, every state is required to set up independent statistical analysis capabilities, to have some focal point of criminal information statistics within the state.

In order to develop a program, he went on, LEAA found it needed to be able to measure the parameters of the problem. However, though the FBI has been collecting data from individual police agencies for 40 years, the picture was not one of uniformity, Hall said.

For this reason, he said, LEAA is requiring each state to assume responsibility for uniform crime reports. Such reports will go to the state center where the quality of the data will be monitored and only then passed on to a national system.

In addition, each state is required to adopt the audit procedures set forth by LEAA and the FBI.

States also have to develop the capability to handle management and administrative data, he said.

Next, Hall went on, the state is required to develop an offender-based transaction statistic program (OBTS), along the lines of Project Search. This will have to be done in conjunction with a computerized criminal history program. The system will permit retrieval of information for bail and sentencing decisions, giving the prosecutor some idea of the type of person he is dealing with, Hall added.

Under OBTS, every criminal agency, judge and police agency will have to report the fact and time of every transaction for every offender as he passes through the system, according to Hall. This data will then be forwarded to a central agency.

The next requirement is that the state assume the responsibility for providing technical assistance to local and state agencies to develop these systems.

Action Plan

LEAA is requiring each state to develop an action plan to implement its program. So far, Hall said, 31 plans have been submitted and 25 have proven acceptable.

LEAA has also given 11 states a grant to work together to develop and implement requirements for a court information system, Hall said. Ten states were also given funds to cooperatively set up a corrections program.

Ark. Grant System Controls Crime Funds

CHICAGO – Due to the ever-growing number of grants, subgrants and applications in process for federal funds, the workload and administration responsibility of the Arkansas Commission on Crime and Law Enforcement has increased rapidly in the last few years.

As a direct result of this increase, the Arkansas commission has implemented an automated fund accounting and information system for all funds awarded and administered by the commission. This system, described by Mary Ellen Henderson, the commission's fiscal officer, at a criminal justice symposium here, allows the commission to evaluate and award subgrants, disburse funds and keep accurate and current records of obligated and expended funds.

Consisting of 17 background programs and eight on-line programs (all written in ANS Cobol), the system covers major accounting functions with particular emphasis given to the requirements of the Law Enforcement Assistance Administration and the State of Arkansas.

The on-line programs are used to enter, modify, check and delete records in the two index-sequential files that make up the system, Henderson said.

A subgrant file, she said, contains 500-byte records, one record for each type of fund subgrant awarded by the crime commission.

The second file contains four types of records including a fund record for each fund type for each fiscal year, and a program record for each fund type program and subprogram category for each year.

The other two records are the expenditure record for each class by grant as approved, and a transaction record which is used for audit trails and posting accounting summaries.

A third file, the dictionary, is used to eliminate the need to continually recompile the programs for minor changes in the system, such as new programs approved by LEAA, Henderson said. The dictionary consists of an indexed-sequential file with 80-byte records. These, she added, usually contain a code and the English description for that code.

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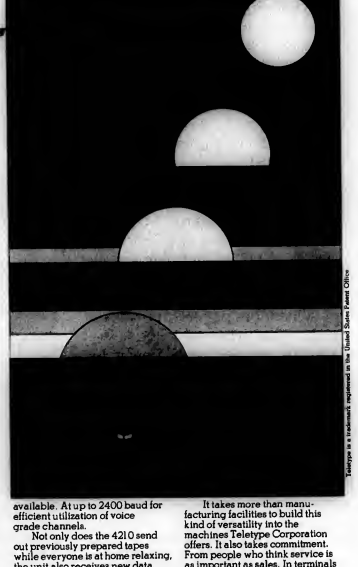

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Blame it on sunspots or maybe a worn tapehead. The fact remains, when computer errors hit your production line, it could end up costing you a lot of dough.

What you need is a way to cut the possibility of these errors down to a bare minimum. And the best time to start is when you place your next order for computer tape. Just specify BASF.

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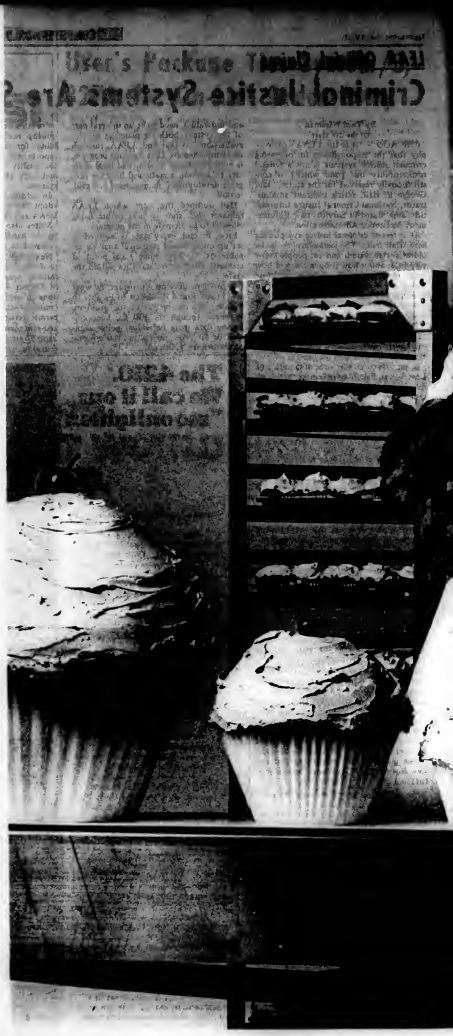
One more point. Our tapes don't cost any more than the competition's. You're already paying for BASF quality . . . you might as well have it. Write today for the complete story of how BASF computer tapes stack up against the competition. Remember, nobody makes better tape than the people who invented it. BASF Systems, Crosby Drive, Bedford, Mass. 01730.



When it's BASF...you know it's

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Cost/Benefit Studies Not Always Answer to Managers' Problems

NEW YORK – No automatic mechanism such as charging a firm's DP costs to the user departments can guarantee that management's purposes are really being served, Duane R. Borst, comptroller of Inland Steel Co., told a Conference Board panel here.

Thorough, realistic projections of costs and benefits are not always the best answer to project selection and allocation of DP resources, he said, giving an example from his own experience.

At one of the firm's affiliates, the general manager of the largest plant pushed through a proposal to build a real-time, on-line order entry, inventory management and credit approval system, Borst said.

Direct benefits were minimal and the risk of failure high, he noted, but management approved the project on the grounds that fast turnaround was the key to survival and growth in the steel warehouse business.

Management's decision proved correct, Borst said, as the plant doubled its former capacity through the ability of the system to process the huge influx of orders without adding people to the order processing function.

'Take Time to Listen'

To ensure that DP serves management's purposes, "management must get involved, take time to listen to and evaluate what the DP specialists are saying, and exercise controls to keep the programs on track," Borst stated.

To do that well, he added, management must make an effort to get basic conceptual understanding of computers, programming and information systems through seminars, in-house training and study.

Another way to ensure that DP serves management's purposes, Borst said, is for management to recognize that "DP is too important to leave to specialists.

"The automatic promotion of internal DP specialists will guarantee a department that will not be attuned to management purposes," he contended.

"The function must be managed by generalists, who may come out of the DP department, but who must prove they have the wealth of understanding of the main functions and the economics of the

(Continued on Page 26)

'Lack of Understanding' Leads to Poor DP

NEW YORK – The rapid growth of DP activity has had a profound and generally positive effect on many business firms, but where the effect has been negative, a "lack of common understanding within the firm on how to review, approve and assign priorities to complex DP systems is often at fault."

Company-wide procedures, called systems development methodology, can be implemented to counter this problem, however, Herbert D. Lechner, senior vice-president, data processing and communications services, American Express Co., told a Conference Board panel here.

The systems development procedures can work in the same manner as uniform procedures for accounting, product development or planning, and can be just as well-understood and controlled by non-DP management.

To avoid problems due to misunderstanding or lack of participation of involved management within the organization, Lechner emphasized widespread understanding and acceptance of the nature of tasks to be done in the development process, full commitment to an agreed-upon and documented systems development plan and an effective progress review and change control procedure.

Training Promises 'Long-Term Staff'

NEW YORK – Because DP for commercial users is generally the means to an end and not the end itself, DP users can have a tough time competing with DP equipment and service suppliers for the best professional talent.

CW Photo by Edward J. Bride

Garrison

But a commercial DP installation can meet this challenge through its own career development program, according to Kenneth T. Garrison, vice president, systems and data processing, for Pacific Mutual Life.

Speaking at the Conference Board's conference on "Senior Management and the Data Processing Function" here, Garrison described a training program representing a significant commitment in dollars, management and staff time.

Such an investment, he said, comes from the decision to develop "a long-term staff resource."

In order to develop its own career development program, Garrison said his firm looked to the future to determine what sort of computer systems it would be using. The next step was to develop a comprehensive staff inventory of skills.

From this evolved updated position descriptions, graphic maps which represent the requirement in the positions and course objectives.

A manpower planning executive (MPE) is responsible for review, revision and administration of the training program and its content. Line managers are held responsible for career path progress of their assigned personnel. Career path progress records are maintained on each staff member by both his line manager and the MPE.

In the fall of each year training requirements for the next year are assessed. Using the training map as a guideline, line managers and the MPE plan and budget training courses and establish schedules. These schedules require staff members to spend no less than 5% and no more than 10% on education-related activities.

The end objective of this training is increased productivity, Garrison said. His firm is getting a productivity improvement, he concluded, plus the benefit of people getting greater professional satisfaction from their work.

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Texas Instruments announces for the 980A minicomputer interactive terminal processing

DX980 is a general purpose operating system that supports the 980A computer in various applications including batch processing, interactive terminal processing, and real-time processing. It can support all of these applications simultaneously or each one individually.

The Memory Protect/Privileged Instruction feature of the 980A provides a "hardware protected" environment so that an executing program cannot destroy the operating system or another job.

DX980 features a modular organization. Executive functions common to several application environments are included in the nucleus, while executive functions unique to specific environments are embodied in subsystems.

The nucleus is partially memory resident and partially disc resident with the disc resident portions called into memory as required using a dynamic allocation technique. The nucleus provides for such functions as:

Job Management – to provide the facilities for job submission, resource allocation, job initiation, execution management, and job termination. The number of jobs active is limited only by available resources.

Task Management – for task creation, scheduling, synchronization, and termination. Multi/tasking is supported both across several programs and within a single program.

Memory Management – for dynamic memory allocation and release.

I/O Management – to provide I/O functions from programs to peripherals on a device independent basis.

File Management – to provide a device independent interface from a program to data stored on disc. Three file types are supported:

Linked Sequential File – has an access interface identical to that used for the various sequential devices (magnetic tape, line printer, card reader, etc.). Consistency between sequential device and disc is achieved with the Linked Sequential File.

Relative Record File – provides a low overhead direct disc access to a contiguous section where I/O transfers may be either blocked or unblocked.

Indexed File – provides a directory-supported random access method based on a record identifier whose size is user specified. File operations include record addition, insertion, modification, deletion, and retrieval using either a random or sequential access method. A multiway balanced tree directory provides random access with extremely low disc access for search.

Operator Communications – provides an extensive command language that may be used from the system operator's console. Subsystems are individually activated and deactivated by the systems operator as needed. When active, a subsystem operates in privileged mode and is essentially part of the operating system. Main memory is allocated to the subsystem only when it is active so a user who is not interested in a particular operating environment does not pay a penalty for the ability of DX980 to support the environment.

Multi-terminal 980A System

Batch Processing

A batch processing environment is supported by three separate modules, referred to collectively as the Batch Processing Subsystem:

Batch Input Reader – is used to effect direct assignment of a sequential input device to a sequence of serially executed programs.

Batch Input Spooler – is used to effect spooled input from a sequential input device to a sequence of programs

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Highway Right-of-Way System Draws Praise for Kentuckians

FRANKFORT, Ky. – Federal Highway Administration (FHWA) officials have commended the Kentucky Department of Transportation for developing an original computerized system to handle highway right-of-way condemnation cases.

Eighty percent of the transportation department's work is in acquiring right-of-way land for highways, universities and game reserves, according to James D. Robinson, assistant attorney general for the department. When the land can't be obtained by negotiations, a district attorney initiates a lawsuit for the property under the eminent domain statutes.

"When I came one-and-a-half years ago, we had a backlog of over 2,000 cases; we normally file 600 cases a year," Robinson said.

Status Reports

"We were successful in compiling a monthly computer report which gives information on the status of cases, number of cases closed, how they were closed, when they were closed," he added. "Using the computer's memory we can look back and tell how much money is owed the state, how to get it back and how much we've saved the state."

The success of the system, which is run on the state's IBM 370/145, is witnessed by the fact that while the staff normally had previously closed 300 to 400 cases a year, now, using the system to direct the district attorneys and supervising attorneys, the state can close 900 cases.

In addition, Robinson said, it eliminated some 50 contract attorneys (at an $850,000 savings) and, because it could pinpoint the money owed the state, collected approximately $2.5 million, two-thirds of which had been owed for as long as seven to eight years, according to Robinson.

One secretary now does the preparatory work on each case, work that formerly cost $200/case, as she prepares the material for computer input.

David R. Levin, acting director of the FHWA Washington Office of Right of Way, has recommended that all state highway departments consider the use of a similar system. Currently, only Kentucky is using the system, but Montana and Florida have requested information on it, Robinson said.

...While Tulsa Has Hopes for Street Plan

TULSA, Okla. – The "secret weapon" hoped for by Tulsa Street Commissioner Sid Patterson to bring about "the best expressway system of any city under a million population" is a computerized sufficiency rating system similar to the one used by the state Highway Department.

"The system could produce a guidance index, the overall picture as well as a detailed look at any street," according to Harold Miller, city engineer.

Monthly reports would update data on the structural adequacy of a street according to its load, traffic capability based on use frequency and lane capacity based on width and numbers. Among the huge amount of data that would be fed into the computer are cost data, which would state what action could be taken, the cost and the probabilities of service and durability.

The plan, however, is "on the back burner now" because of processing problems, computer time problems and personnel problems, according to Miller. Essential to the system is a street maintenance engineer, a "rare animal," according to Miller. "In the last nine months we've offered three men the job. They went back home to resign and got promotions.

"We would like to have had the system on-line a year ago," he said.

The system won't save any money, according to Miller. "You'll have to spend a little more money; it's just another management tool. A computer may have allowed more efficient spending of money but it never saved anybody any money."

DX980—an operating system that supports batch processing, and real-time...simultaneously.

which may execute in parallel.

Batch Output Spooler – is used to effect spooled output to a sequential output device.

Interactive Terminal Processing

DX980 provides for interactive communication between the system and local or remote terminals through the Interactive Terminal Subsystem. The features provided include:

- An interface to support multi-user interactive applications programs
- Interactive file editing
- Remote job entry
- Job status retrieval

Real-Time Processing

DX980 provides for multi/tasking on a priority scheduling basis. The processor may be switched from task to task by an I/O request, a supervisor call, a device interrupt or at the end of a task. It provides a roll-out/roll-in feature to insure real-time response to high priority requests.

Other Software

DX980 supports a variety of software including FORTRAN IV, symbolic assemblers, the TI language translator and the linkage editor.

It will operate on any 980A system with at least 16K memory, an interval timer, an operator's console and a disc. The modular structure allows expansion to include:

- Multiple 3330 type disc drives
- Multiple disc cartridge drives
- Magnetic tape drives
- *Silent 700*® ASR or KSR data terminals
- Card readers
- Line printers
- Alphanumeric CRT terminals
- Paper tape readers and/or punches

Low-cost 980A Software Development System

- Communications interfaces
- Hardware vectored interrupts
- Up to 64K words main memory

DX980 allows users with big jobs to do their processing in an economical manner. However, Texas Instruments also offers software to support the many users who do not need a large disc-based system to solve their problems. For this class of user TI offers the Program Development System shown above. This system may be as simple as a 99/25 package of an 8K 980A with a twin cassette *Silent 700* ASR terminal. It enables fast and easy development of new software. Speed, simplicity, and reduced noise level are the major advantages over a system equipped with a 33 ASR.

Standard software includes:

- Loader
- I/O import package
- Assembler
- Linkage editor
- Source editor
- Debug aids
- A wide variety of additional peripherals, plus expansion capabilities to support FORTRAN

Hardware

This software has been designed to take advantage of the powerful features of the 980A, which include:

- Hardware multiply/divide
- Memory parity
- Memory protect
- Privileged instructions
- Power fail interrupt
- ROM bootstrap loader
- Removable control panel with keylock
- Hardware breakpoint and program sense switches
- DMA interface port, expandable to 8 ports
- Four I/O bus ports, up to 256
- Auxiliary processor port

The 980A is the price/performance leader in the computer world.

Want more information? Get answers by writing or calling Texas Instruments Incorporated, P.O. Box 2909, Austin, Texas 78767; or phone (512) 258-5121.

TEXAS INSTRUMENTS
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Blank Tapes Cause Human Traffic Jam

MIAMI – Strange as it may seem, blank computer tape can create a human traffic jam at a motor vehicle registration office.

As a result of two blank tapes, almost a third of Dade County's auto owners did not receive their preprinted registration forms through the mail as expected by the first day new auto license tags went on sale. This meant clerks had to fill out forms manually, resulting in long waits in line at the registration office for motorists.

Part of Agreement

The Dade computer center had agreed to furnish the state with computer tapes containing Dade's complete auto registration, according to Dick Sherwin at the state computer center in Tallahassee.

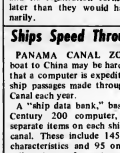
When the tapes arrived, however, he said, two were discovered to be blank. By the time new completed tapes arrived, Dade was "shoved to the end of the line" and its registration forms were mailed later than they would have been ordinarily.

Ships Speed Through Canal

PANAMA CANAL ZONE – A slow boat to China may be harder to find now that a computer is expediting the 15,000 ship passages made through the Panama Canal each year.

A "ship data bank," based on an NCR Century 200 computer, contains 240 separate items on each ship that uses the canal. These include 145 on the ship's characteristics and 95 on transit times, tolls and cargo for each passage.

To facilitate storage of data, each ship is assigned a permanent identification number. Using the number to find the stored data, the computer can automatically determine the number of pilots, towing locomotives, wires and tugboats needed for each vessel as it traverses the canal.



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Cost/Benefit Studies Don't Always Serve Company's Purposes

(Continued from Page 24)

business."

Borst believes a "central utility concept" of DP is the best way to serve a company's disparate needs.

At Inland Steel, for example, systems and data processing are in a separate department, lodged in finance for administrative purposes, but under the direction of a steering committee consisting of the major department heads and subsidiary presidents, he said.

Systems serves all parts of the company, and DP is increasingly becoming a central utility furnishing power to process information, Borst said.

Systems does not pretend to have adequate substantive knowledge of the wide ranges of specialization in which it exercises its problem-solving skill, he added. As a result, all new systems development, including MIS, is developed in tandem with the users, and under the overall direction of the users' management.

Systems is also functioning as a problem-solving utility – to which any user can tap in his specialized problems in information handling and specialized knowledge of the substantive matter.

In this setting, Borst said, no special organization is required to develop, operate, or maintain any particular kind of MIS (sales, manufacturing, accounting, personnel, etc.). "The guy with the problem taps into the central utility with his problem and knowledge – and develops a system to solve his problem – to his satisfaction," he explained.

The DP function is essentially no different from any other business function, Borst concluded. It must be guided and controlled with the same techniques used for other management functions.

Councilmen Just Employees

FORT WORTH, Texas – An employee is an employee is an employee . . ., according to the Fort Worth City Hall computer, and that includes city councilmen.

Fort Worth's city charter requires new employees to serve on a probationary status for three months. Then, in most cases, they receive either a pay increase or a termination notice. The city's computer has been programmed to notify supervisors when an employee nears the end of his probationary period.

Because three new councilmen were placed on the payroll to receive the customary $10 per meeting salary, the computer assumed they were municipal employees and dutifully notified city secretary Roy Bateman that the three were approaching the end of their probationary period. The computer suggested Bateman evaluate their work to determine whether they should get pay raises or pink slips.

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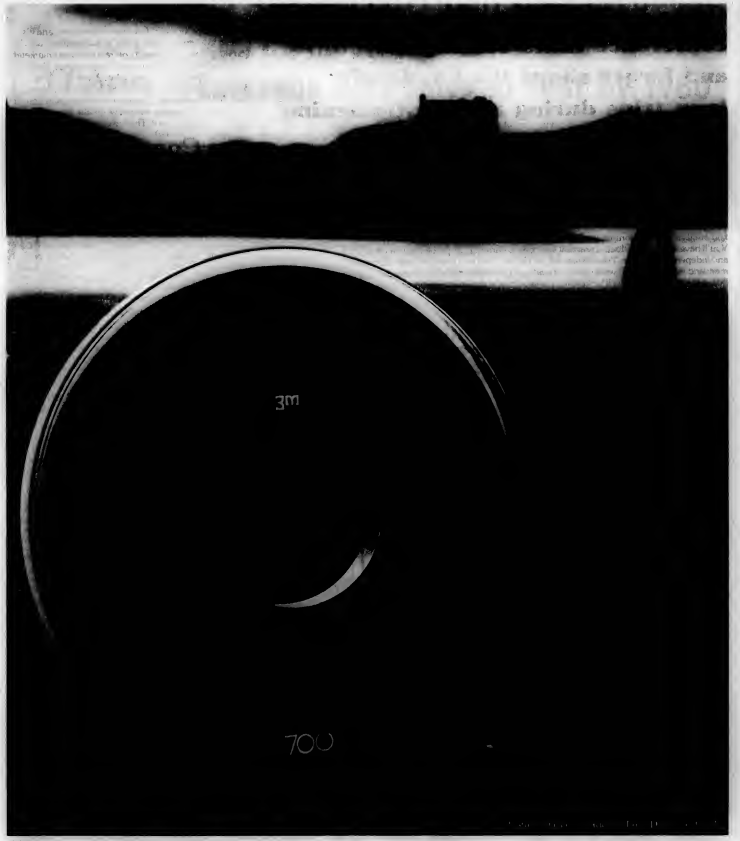

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CI Notes

Lessor Sues IBM

LOS ANGELES – Hudson General Corp., a third-party lessor which owns Telex peripherals, has filed a $28 million antitrust suit against IBM in federal court here.

The claim is based on the Telex-IBM suit. Transamerica Computer Corp., another lessor, has also filed suit against IBM.

Between 1969 and 1971, Hudson purchased about $35 million of Telex peripheral equipment.

"The Hudson General suit appears to be based on the judge's findings in the Telex case. We believe the findings to be erroneous and have asked for an expedited appeal," an IBM spokesman said.

IBM-Telex Bids Consolidated

DENVER – The Tenth Circuit Court of Appeals here has granted the joint Telex and IBM motion to consolidate their appeals and allowed IBM's motion for an expedited appeal.

In addition, the court granted IBM a stay on the amended judgment that enjoined IBM from engaging in predatory pricing.

Burroughs, Odec Sign Printer Pact

WARWICK, R.I. – Odec, Inc. has entered into manufacturing rights and financial agreements with Burroughs Corp.

Burroughs has agreed, in an amendment to an existing contract, to buy from Odec a percentage of its requirements for two additional types of line printers through 1977. Odec has granted Burroughs manufacturing rights to these printers.

Burroughs also purchased a $2 million five-year convertible note.

Correction

A statement in last week's *Computerworld* and attributed to Lester T. Kilpatrick, president of Calcomp, should have read:

. . . his company had not engaged in industrial espionage or hired a single development engineer from IBM.

Supershorts

National Computer Rental, Ltd. and Boothe Computer Corp. have terminated negotiations relating to the acquisition of Boothe by National Computer.

– – –

University Patents, Inc. has been named the exclusive licensing agent for Dirks Computer Systems Corp.'s patents, many of which are currently licensed to IBM and Sperry Rand.

– – –

Pertec Corp. has appointed Robinco, A.G. Switzerland as its distributor for Eastern Europe for data entry systems.

Report Sees $110 Million

European POS Sales to Soar by 1980

By Toni Wiseman
Of the CW Staff

LONDON – Western European sales of point-of-sale (POS) equipment will amount to over $2 billion over the next 10 years, of which nearly $1 billion is in electronic cash registers and $850 million is in the electronic POS systems, according to a forecast by Frost & Sullivan, Ltd.

By 1980, the forecast predicted total sales of $321.5 million, with electronic registers accounting for $130.3 million, POS systems for $110.2 million and electromechanical registers only $81 million.

POS sales were estimated at $246.7 million in 1972, with a breakdown of $208 million for electromechanical cash registers, $16.3 million for electronic cash registers and $22.4 million for POS systems.

By 1978, POS sales are predicted to be $308.5 million, with a breakdown of $99 million for electromechanical cash registers, $125 million for electronic cash registers and $103.7 million for POS systems.

Germany will lead in installations with POS sales forecast at $10.8 million in 1973, rising to $65.7 million by 1980.

France and the UK follow with predicted sales of $44.3 million and $42.1 million respectively by 1980.

There are over 30 manufacturers offering, or planning to offer, POS equipment in the European market, the report said.

Three Leaders Emerging

A user survey indicated a preference for NCR and Sweda equipment, with Pitney-Bowes and Anker following.

By 1980, however, Litton, NCR and Nixdorf will be the major suppliers in the European area, controlling two-thirds of the total market between them, the report forecast.

Although the majority of large retailers in Europe plan to eventually install POS systems, it will be several years before any marked penetration starts, the survey indicated.

Sales to the department store sector will be $105 million in POS systems and $58 million in electronic cash registers through the end of 1980, the report predicted.

The first POS applications will surface in the department and variety stores, many of which include supermarkets within the same building, according to Frost & Sullivan.

The report predicted sales of 6,600 free-standing POS terminals to the multiple stores market by the end of 1980. These, along with 30,000 electronic cash register units, will represent total shipments of over $100 million during that period.

Supermarkets Big Market

Supermarkets will be the biggest single market sector for electronic POS sales during the coming decade, Frost and Sullivan said.

The value of POS sales to supermarkets in 1980 is estimated at $430 million by the report, with annual sales building up to over $90 million a year.

Forecast Sees Industry Unscathed By Energy Crisis Through 1974

NEW YORK – A direct adverse effect on the DP industry is not expected under the current economic conditions caused by the oil shortage, according to an analysis by Blyth Eastman Dillon & Co.

The analysis indicated enough momentum from current strong orders, backlogs and shipment rates to carry the DP industry through 1974, unless a worldwide depression develops.

DP manufacturers are benefiting from increased productivity, the analysis stated, which in turn stems from the greater usage of large-scale integration (LSI) that significantly reduces space and labor requirements.

Most plants could schedule a four-day week and still maintain adequate production level, the report estimated.

Currently, the nation is well into an economic scenario of a mini recession, with a real gross national product (GNP) forecast of 2.5% to 3%, the firm said.

The figures are based on an oil shortfall of 1 million barrels a day.

A cutback in the U.S. supply of oil by two million gallons a day would qualify as a recession with zero growth, the report indicated. In this instance, corporate profits would fall by 10% to 15%, the investment firm said.

An oil shortfall of three million barrels a day, the analysis estimated, would bring on a major recession, "the worst since World War II," with the slowdown far more pronounced abroad. The real GNP would decline 4%.

In view of the more serious impact of the oil crisis on foreign nations given the greater dependence of Europe and Japan on Middle East oil, the report continued, the crisis could bolster the U.S. dollar versus foreign currencies, lower interest rates, cool inflation and bolster stocks.

"The most significant, though indirect, effect of an energy crisis would be from the reduction or stretching out of capital spending plans," the report indicates.

"Recent strong capital spending has materially aided outright sales and if it were slashed, revenues could be materially impacted," the report stated.

Crunch Should Help Honeywell

LOS ANGELES – The economy's demands for increased productivity should have a favorable impact on Honeywell's computer business, Chairman James H. Binger told security analysts here recently.

In expressing optimism about the company's ability to help supply answers to problems created by the economics of worldwide scarcity, Binger said, "Almost everything we do will increase a customer's productivity, let him use plant, raw materials and energy better, reduce work-in-process, increase throughput, improve quality and control waste and pollution."

Binger said he is encouraged by the fact that net backlogs of computers are the highest in company history and that customers' requests for delays of shipments – which often signal a downturn – are not occurring.

Other positive aspects of Honeywell's computer business are that its users' systems in general are fully loaded, contrary to the industry condition of excess capacity that existed in the 1971 recession, he said.

There is also a user trend toward systems integration, and new computer applications demanding data communications and networking capabilities which provide opportunities for the user to cut costs while increasing Honeywell's net yield.

"Most of all, the energy crisis, its related crunches and the numerous unknown factors surrounding it, make it absolutely imperative that we look with greater diligence for new ways to do things better," he added.

Binger said Honeywell's corporate objectives call for earnings to increase faster than sales. Sales should increase in the range of 10% to 12% annually in the coming years, or even more, "depending on our success in increasing our market share in some areas and continuing to find new and expanding markets.

"I would be disappointed if in the future our earnings do not continue to show a rate of improvement comparable to that of the last three years – that is, in the neighborhood of 15% a year," he added.

Read all about it in Computerworld's special year-end review and forecast.

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HP Eyes More Microprogramming, Varied Products

By Molly Upton
Of the CW Staff

PALO ALTO, Calif. - Hewlett-Packard plans to enhance its microprogramming offerings, expand its range of products, including better peripherals, systems and applications software, and take a "very aggressive position" on its 3000 "multiprogramming, multiaccess, multiterminal" system, according to Ed McCracken, the new marketing manager for the Data Systems Division.

The firm is enhancing its line of DOS offerings, including a new 2100 DOS III program. It also has announced a terminal control program, aimed especially at the distribution or order entry market.

The 2100 Series, based on microprogramming, will have a Fast Fortran program that will be significantly faster than the current HP offering, he said in an interview.

There's definitely a trend toward putting more software of the most often used routines into firmware, he said.

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About four years ago, he said, the mini market consisted almost exclusively of sophisticated end users and the OEM customer who selected a product on the basis of specifications.

Now, these comprise about 60% of the market, while 30% consists of users who want solutions to their specific problems, and expect the manufacturer to offer the solution, he observed.

McCracken named the education, medical and distribution/finance fields as three significant market segments in which HP will further develop applications software.

2100s move toward the shipment room.

In the distribution field, McCracken sees a trend toward decentralization, with most companies having a need for computing power at their regional distribution points where the inventory is kept.

A mini capable of handling terminals, which can perform editing and formatting, will fill this need, he said.

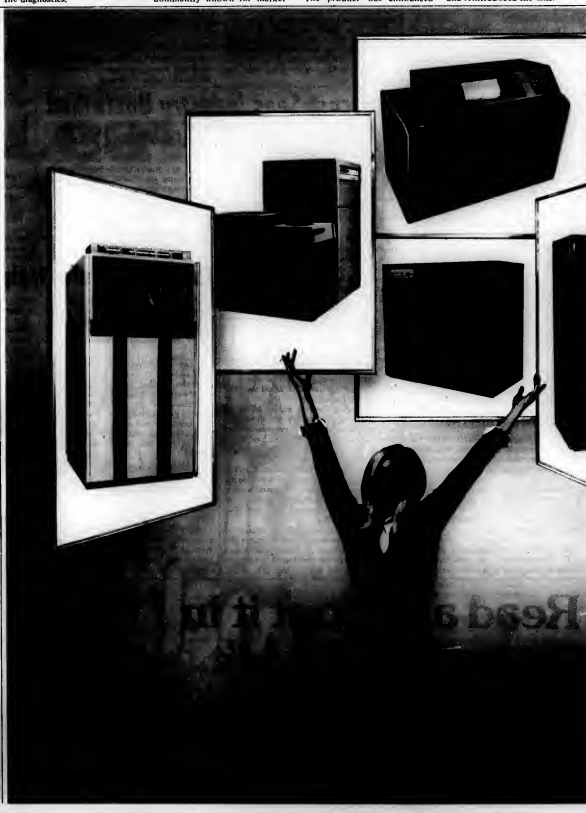
HP already has a large share of the instructional market, especially at the secondary and elementary levels, he said. The firm's announcement of the 2000F this fall not only cut the price of the time-sharing unit, but also reduced maintenance cost for the user, McCracken said.

In 1972, the firm was predominantly known for marketing to the end user. In 1973, HP significantly continued the end-user growth and probably doubled its share of the OEM market, McCracken said.

He concurred with a market study that named HP number two in the mini area. Digital Equipment Corp. was number one.

The 3000 system, which sells for between $140,000 and $300,000, is directed to the market consisting of batch users. The system handles Cobol, Fortran and Basic simultaneously, he said.

The product was announced



CW Photos by M.Upton

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UK Buy/Sell Gap Widens

Special to Computerworld

LONDON – The gap between imports and exports of computer equipment continues to widen here, with figures for the first nine months of 1973 showing a deficit of $120 million, compared with $70 million a year ago.

In 1972, exports stood at $245 million with imports of $315 million. This year, exports grew to $377 million but imports jumped to $497 million.

UK Market Needs 5% Growth to Keep Up

LONDON – The UK computer market is not expected to keep pace with the West German, French and Italian markets unless an annual growth rate of 5% in gross domestic product (GDP) is achieved, according to a recent

International Round Up

report by the Electronics Economic Development Committee (EEDC).

From a 1971 production of $486.7 million, the 1977 figure is expected to be $1.18 billion (assuming an annual 5% GDP) or $1.12 billion (assuming 3-1/2% growth).

The home market is expected to grow from the $428.2 million figure in 1971 to $889.2 million or $994.5 million depending on the GDP growth.

By 1977, exports are projected to increase approximately 2.6 times over the 1971 figure. Imports, based on the projected GDP growth, will grow from $161.4 million in 1971 to $351 million or $397.8 million.

The development of software, increased performance of both processors and peripherals and a reduction in cost/performance were cited as contributing to market growth.

Growth areas identified by EEDC are minicomputers for use in control and automation systems and in communications-related applications.

The export expansion to about 50% of production by 1977 is contingent, according to EEDC, on the success of International Computers Ltd.'s European export drive and the company's continued strong position in the Australian, South African and Eastern European markets, as well as continued willingness of U.S. computer manufacturers to expand their operations in the UK.

Buy Small – Buy British at Issue

LONDON – The choice of a Xerox Data Systems 530 computer over one built by Computer Technology Ltd. has highlighted the issue of whether government preference toward British-made computers should extend to small computers.

Currently, the government shows preference toward International Computers Ltd. when procuring large machines.

The Xerox order was placed by the Civil Service Department for the Laboratory of the Government Chemist.

It has been the subject of controversy because the Department of Trade and Industry has already invested about $12 million in Computer Technology Ltd.'s Multidab system, designed to automate instruments in major laboratories.

The government recently denied a request from Computer Technology Ltd. to review the order for the 530 in favor of the company.

Secretary of State for Trade and Industry Peter Walker said in a letter to CTL that the procedure followed agreed with government policy, and no review of the decision was proposed.

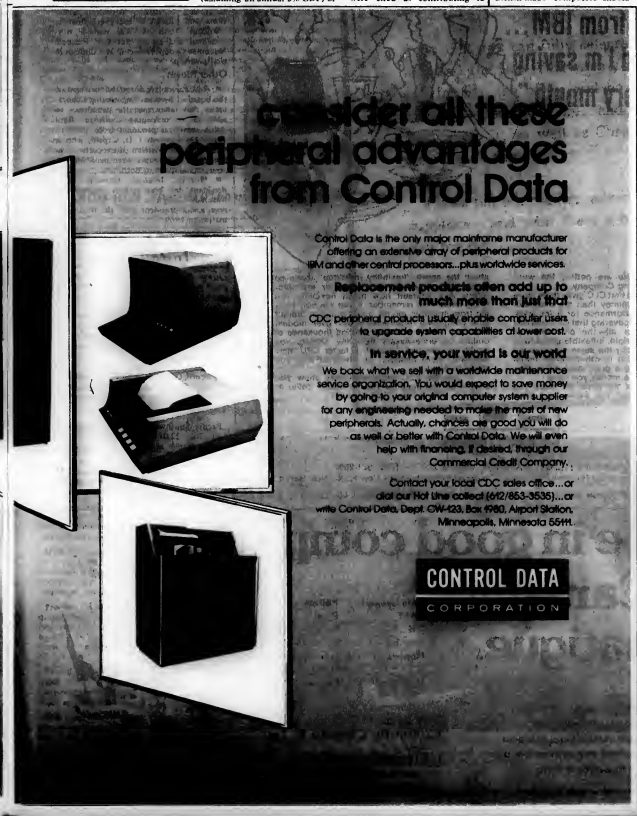
Airey Neave, chairman of the Commons Select Committee on Science and Technology, has indicated his committee will review the question of government procurement policy.

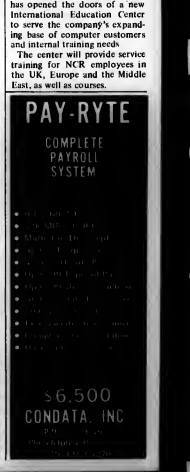
The last two contenders for the award were reportedly the XDS 530 and two Control Data Corp. 1700s.

NCR Has Training Unit

DUNDEE, Scotland – NCR has opened the doors of a new International Education Center to serve the company's expanding base of computer customers and internal training needs.

The center will provide service training for NCR employees in the UK, Europe and the Middle East, as well as courses.





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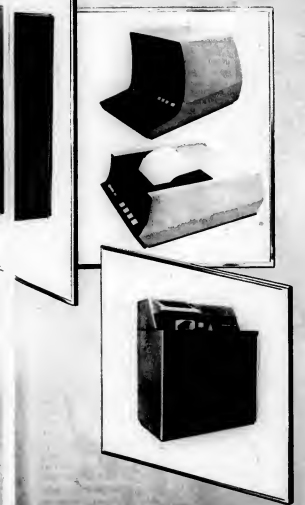

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Mirabito Appointed Burroughs President

DETROIT – The naming of Paul S. Mirabito as president and chief operating officer and Ray W. Macdonald, formerly president, as chairman of the board and chief executive officer, led a list of new appointments made recently at Burroughs Corp.

Mirabito has been executive vice-president since 1968 and was previously group executive, Defense, Space and Special Systems Group.

The executive office was enlarged with

Executive Corner

the appointments of three executive vice-presidents: James A. McCullough, planning; Ben L. Rouse, marketing operations, and Charles E. Exley Jr., finance.

William TenBrink was named vice-president and group executive, Business Machines Group, replacing McCullough in that position.

Other Moves

■ A.G. Randolph, formerly chairman of the board of Systems Engineering Laboratories, has taken over the presidency in addition to remaining chairman. Randolph served as president from 1966 to 1969. He succeeds C.D. Griffin, who is moving to the position of executive vice-president. The moves were made on the recommendations of both men.

■ Merrill Denton, formerly vice-president, has been named president of National Computer Utility Co. He has been a vice-president since the firm's formation in 1969.

Orders & Installations

Jones & Laughlin Steel Corp. has ordered a Honeywell Model 6060 to replace seven existing IBM 360 systems.

– – –

Reliance Federal Savings & Loan Association of New York has ordered 31 Bunker Ramo 2001 Universal Teller Terminals, which will be tied to a Univac 9480.

– – –

Systems Control, Inc. has ordered a Systems Engineering Laboratories, Inc. Systems 85 for use in a signal processing research facility.

– – –

Pacific Southwest Airlines has installed 140 BR 2210 CRT terminals from Bunker Ramo, as part of an on-line reservations system.

– – –

Roach Paint Co., Inc. has ordered a Univac 9480 system for sales forecasting, inventory control, data entry processing and general accounting.

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Cambridge Posts Record Earnings And Revenues for Quarter, Year

CONCORD, Mass. – Record earnings and revenues were the story at Cambridge Memories, Inc. for the fourth quarter and year ended Aug. 31.

During the year, the company spent over $2.1 million on research and over $2 million on marketing, both of which were expensed on a current basis, according to President Joseph F. Kruy.

"Both these expenses . . . have given us a solid product development and customer service foundation which will be of significant benefit in the future," he said.

The First National Bank of Boston is providing a $14 million revolving credit line which will be used to finance Cambridge's leased memories. Cambridge said it expects the bank credit to be sufficient to meet its lease financing needs through the end of 1974.

Revenues in the year rose to $12.7 million from $4.1 million while earnings jumped to $625,903 or 49 cents a share from $232,340 or 23 cents a share in 1972.

For the quarter, revenues totaled $4.4 million compared with $1.4 million a year ago. Earnings rose to $200,221 or 16 cents a share compared with $102,794 or 10 cents a share. There was no tax credit in the 1973 period, and a $47,300 or 5 cents a share credit in the year-ago quarter.

Alpex Finances Show More Debt

DANBURY, Conn. – Following the announcement of the closing of Pitney Bowes-Alpex, Inc., coparent Alpex Computer Corp. disclosed its finances, revealing more short-term debts than assets.

Current assets consist "almost entirely" of cash and short-term investments of about $1.5 million. Long-term debt totals $7.3 million in 7.5% convertible subordinated debentures due in 1984, the firm said.

Alpex said the collectibility of $11 million in long-term notes and debentures owed by Pitney Bowes-Alpex "would be uncertain" if Pitney Bowes proceeds with the announced closing of the joint company.

...Toward the Bottom Line

Fujitsu plans to increase its stock to 707.5 million shares from 568.7 million through a rights issue and a public offer. Shareholders of Jan. 1 will be given rights to purchase one new share for each five shares held. The offering price is about 18 cents a share.

$$$

Sycor has called for redemption of all of its 6% convertible subordinated promissory notes due Dec. 31, 1975, and its Series A $6 cumulative convertible stock, originally issued in March, 1971. The call is expected to result in a strengthened balance sheet, President Samuel N. Irwin said.

$$$

Xerox is offering $75 million of 15-year convertible debentures to foreign investors. Proceeds will be used for various purposes, including financing of overseas subsidiaries.

$$$

Wangco's backlog of OEM orders for disk drives, excluding the new Series-N, has topped the $5 million mark, the firm said.

$$$

Sanders Data Systems 1973 sales were 23% ahead of those in 1972.

Acquisitions

American Hospital Supply Corp. has acquired Hospital Computer Center, Inc. in exchange for 45,995 shares.

Storage Technology Corp. has completed the acquisition of 80% of Pronodata, S.A., for an undisclosed amount of cash.

GTE Sylvania, Inc. has agreed to acquire four schools of RCA Institutes, Inc. The units will become part of GTE Sylvania Technical Schools.

Process Control, Inc. has acquired the marketing and manufacturing rights, inventory and backlog of Analog Digital Systems, for an undisclosed amount of cash.

Terrell, Inc. has offered to acquire 63% of Pioneer Texas Corp.'s (formerly DPA) common stock at $8 a share.

Itel Corp. has acquired Transportation Management Services, Inc. for an undisclosed amount of cash and contingent cash payments. The agreement provided for the acquisition by Itel of all of the stock of M.J.B. Management Corp., the parent and owner of all TMS stock.

COMPUTERWORLD

memo

December 1, 1973

Memo to the Staff:

So that you can fully celebrate Christmas and the New Year with your family and friends, the office will be closed on Monday, December 24, and Monday, December 31, as well as Christmas and New Year's days.

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Planning Loses $8.5 Million

LOS ANGELES – Writeoffs in reservations systems equipment and special charges from the sale of Greenwich Data Systems as well as expenses for management reorganization and bad debts combined to give Planning Research Corp. a loss of $8.5 million in the year ended June 30.

In 1972, the firm earned $3.2 million or 50 cents a share.

Revenues continued to grow, reaching $98.1 million compared with $83.3 million.

A $6.9 million writeoff principally covered equipment and deferred software costs of International Reservations Corp. All equipment at International Reservations and at Realtronics Computer Systems, Inc. was written down to net realizable value, the firm said.

A special charge of $2.9 million reflects the sale of Greenwich and the closing of Storck, Cataldo, Carroll & Associates.

A fourth quarter charge of $671,000 was made for a management reorganization and bad debts.

President William K. Hodson said, "I believe that our major problems are behind us." The firm has completed major refinancing of $25 million, and management is emphasizing internal growth, he said.

GCS Shows Profit

DALLAS – With revenues more than doubling, key-to-disk maker General Computer Systems, Inc. broke into the black for 1973, with earnings of $774,070 or 47 cents a share, compared with a 1972 loss of $363,339 or 28 cents a share.

The 1973 figure includes a $365,054 or 22 cents a share tax credit.

Revenues jumped to $9.8 million from $4.5 million.

Earnings Reports

AMPEX
Three Months Ended Oct. 27

	1973	1972
Shr Ernd	$.10	$.02
Revenue	87,512,000	66,971,000
Disc Op	.....	480,000
Tax Cred	212,000	.....
Earnings	1,053,000	271,000
6 Mo Shr	.18	.....
Revenue	130,165,000	122,877,000
Disc Op	.....	489,000
Tax Cred	490,000	.....
Earnings	1,925,000	(2,884,000)

ANDERSON JACOBSON
Three Months Ended Sept. 30

	1973	1972
Shr Ernd	$.04	$.03
Revenue	2,056,013	1,305,823
Earnings	108,132	75,182
6 Mo Shr	.08	.08
Revenue	3,877,036	2,503,075
Spec Cred	.....	a36,694
Earnings	200,057	162,694

a-From sale of land.

SCAN-DATA
Three Months Ended Sept. 30

	1973	a1972
Shr Ernd	$.02	$.09
Revenue	1,810,263	2,023,508
Tax Cred	9,964	42,582
Earnings	34,299	147,254
9 Mo Shr	.03	.....
Revenue	5,103,114	3,984,379
Spec Item	b17,349	d259,000
Earnings	49,685	(588,389)

a-Restated. b-Tax credit. d-Charge; from cumulative effect on prior years to Dec. 31, 1971, of change in accounting for previously deferred marketing and installation expenses.

CALIFORNIA COMPUTER PRODUCTS
Three Months Ended Sept. 30

	1973	1972
Shr Ernd	$.42	.....
Revenue	25,683,000	$12,992,000
Tax Cred	537,000	.....
Earnings	1,252,000	(2,283,000)

Position Announcements

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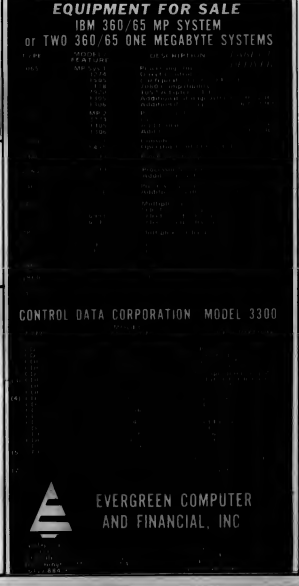

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Inforex 3d-Period Earnings Improve

BURLINGTON, Mass. – Inforex, Inc.'s third-quarter revenues and earnings improved over those of the previous quarter and year-ago period.

Operating income rose by a larger percentage than revenues since the previous period, reaching $1.2 million from $873,000. Increased interest expenses and lack of favorable foreign exchange adjustments resulted in a pretax income about the same as the previous quarter, or $935,000.

Quarterly income from operations accounted for nearly one half that in the nine months, but earnings in the third period were more nearly one third of earnings for the nine months.

Higher Tax Rate

The firm incurred a higher tax rate in the third quarter as a result of losses in certain European subsidiaries, particularly in the United Kingdom where the firm began a company-owned operation replacing a distributor, a spokesman said.

In the quarter, Inforex earned $854,000 or 31 cents a share, including a $490,000 or 18 cents a share tax credit, compared with earnings of $525,000 or 23 cents a share, of which $278,000 or 12 cents was from tax credits, in the 1972 period.

Quarterly revenues jumped to $10.3 million from $6.1 million in the year-ago period. Sales to Leasing II increased slightly to $2.1 million from $1.9 million, while other sales rose to $3.4 million from $1.5 million.

In the nine months, earnings jumped to $2.6 million or 95 cents a share compared with $535,000 or 23 cents a share in the 1972 period. There was a $1.2 million or 44 cents a share tax credit in the 1973 period, and a $453,000 or 3 cents a share credit in 1972.

Revenues rose to $27.1 million from $15.8 million a year ago, with sales to Leasing II declining to $4.7 million from $5.2 million while other sales nearly tripled to $9.8 million from $3.5 million in the year-ago period.

Sycor Reports Third-Quarter Loss, But Nine-Month Earnings Triple

ANN ARBOR, Mich. – A change in accounting methods caused Sycor, Inc. to show a loss in the third quarter ended Sept. 30, but the firm showed improved earnings in the nine months.

The firm changed to the operating method of accounting for transactions involving equipment on lease which had been sold to a third party and previously reported as sales.

These transactions are now recorded as rental income under the operating method.

For the nine months, revenues more than doubled to $22.8 million from $9.9 million in the year-ago period.

Earnings tripled to $1.3 million or 51 cents a share compared with $434,300 or 17 cents a share in the same year-ago period.

The 1973 earnings figure includes a $2.1 million charge for the accounting change, and a $1.4 million tax credit.

In the third quarter, revenues again more than doubled to $8.7 million from $3.8 million.

Including the $2.1 million special charge, the firm lost $775,600 or 26 cents a share compared with earnings of $275,100 or 12 cents a share in the year-ago period.

ADR Earnings Rise, Revenues Set Record

PRINCETON, N.J. – Applied Data Research, Inc.'s third-quarter revenues reached almost $3 million, a new record, and earnings marked the third consecutive quarter of improvement.

Quarterly earnings reached $123,298 or 10 cents a share compared with a loss of $66,586 or 7 cents a share in the year-ago period.

In the same 1972 period, the quarterly revenues were $2.1 million.

Nine-month earnings reached $259,825 or 22 cents a share, up from $27,517 or 3 cents a share in the same 1972 period. Revenues rose to $8.1 million from $6.5 million a year ago.

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COMDISCO
Year Ended Sept. 30

	1973	1972
Shr Ernd	$.95	$.63
Revenue	24,162,144	14,867,465
Earnings	1,149,325	652,097
3 Mo Shr	.26	.23
Revenue	4,921,042	4,570,322
Earnings	314,752	247,614

SANDERS ASSOCIATES
Three Months Ended Oct. 26

	1973	1972
Shr Ernd	$.30	$.22
Revenue	35,749,000	35,654,000
Tax Cred	509,000	259,000
Earnings	1,377,000	1,019,000

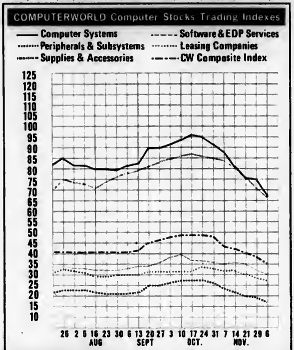
DATAPOINT
Three Months Ended Oct. 31

	1973	1972
Shr Ernd	$.41	a$.10
Revenue	6,837,000	2,832,000
Tax Cred	265,000	77,000
Earnings	755,000	156,000

a-Adjusted to reflect a one-for-two-and-a-half reverse stock split in February 1973.

COMPUTER INSTRUMENT
10 Months Ended Oct. 5

	1973	1972
Shr Ernd	.....	$.04
Revenue	$3,299,863	3,353,097
Earnings	(273,929)	55,751



COMPUTER INVESTORS GROUP
Six Months Ended Sept. 30

	1973	a1972
Shr Ernd	$.11	$.30
Revenue	10,202,562	7,582,279
Earnings	229,784	666,302

a-Restated

TRACOR
Three Months Ended Sept. 30

	a1973	1972
Shr Ernd	$.33	$.35
Revenue	15,936,000	20,079,000
bSpec Cred	331,000	310,000
Earnings	815,000	864,000
9 Mo Shr	1.57	1.16
Revenue	60,134,000	59,210,000
bSpec Cred	2,101,000	1,252,000
Earnings	3,814,000	2,771,000

a-Includes operations of Astro-Science Corp. subsidiary through April 1973, after which it was disposed of. b-Includes tax credits and equity in extraordinary items of affiliates. In all periods except 1973 quarter, also includes gains or losses from disposition of certain subsidiaries and investments.

INFORMATION MAGNETICS
Nine Months Ended Sept. 29

	1973	1972
Shr Ernd	$.39	$.10
Revenue	13,244,325	3,221,560
Earnings	499,702	110,668

OPTICAL SCANNING
Three Months Ended Sept. 30

	1973	1972
Shr Ernd	$.05	.....
Revenue	4,285,219	$3,464,190
Tax Cred	10,000	.....
Earnings	31,205	(49,961)

CAE INDUSTRIES
Six Months Ended Sept. 30

	1973	1972
Shr Ernd	$.60	$.44
Revenue	27,253,000	30,462,000
Tax Cred	47,000	.....
Earnings	1,253,000	a921,000

a-Restated.

LEASCO
Three Months Ended Sept. 30

	1973	1972
Shr Ernd	$.53	$.74
Revenue	186,492,000	168,659,000
aSpec Cred	732,000	1,340,000
Earnings	8,544,000	11,944,000
9 Mo Shr	2.01	2.00
Revenue	540,562,000	494,268,000
aSpec Cred	4,287,000	3,000,000
Earnings	32,107,000	32,410,000

a-Net realized gains on insurance investments.

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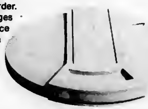

Computerworld Stock Trading Summary

TRADE*QUOTES

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1973 RANGE (1)	CLOSE DEC 3 1973	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	211-232	218 5/8	-8 3/8	-3.7
N	COLLINS RADIO	18- 28	24 3/4	0	0.0
O	COMPUTER AUTOMATION	5- 28	9 1/2	-1 3/4	-13.3
N	CONTROL DATA CORP	31- 82	33	-3	-8.3
O	DATA GENERAL CORP	28- 48	28	-3 1/4	-15.7
O	DATAPOINT CORP	10- 21	11 1/4	-2	-15.0
O	DIGITAL COMP CONTROL	2- 5	2 1/4	- 3/8	-14.2
N	DIGITAL EQUIPMENT	73-117	84	-3 1/4	-3.7
N	ELECTRONIC ASSOC.	3- 9	2 5/8	- 5/8	-15.2
A	ELECTRONIC ENGINEER.	5- 14	8 1/4	- 3/8	-4.3
N	FOXBORO	23- 48	38 3/4	+ 1/4	+0.6
O	GENERAL AUTOMATION	22- 55	28 3/4	-2 1/4	-7.7
O	GRI COMPUTER CORP	1- 3	7/8	- 1/4	-22.2
N	HEWLETT-PACKARD CO	73- 99	77 1/2	-5 1/8	-6.2
N	HONEYWELL INC	74-139	74	-7 1/2	-9.2
N	IBM	249-340	253 1/4	-12 3/4	-4.7
O	INTERDATA INC	7- 14	5 1/5	- 3/8	-6.4
O	MICRODATA CORP	2- 10	2 1/4	- 1/2	-18.1
N	NCR	27- 48	31 3/4	-2 1/2	-7.2
N	RAYTHEON CO	22- 33	25 1/4	-4 3/5	-14.7
N	SINGER CO	38- 74	37 3/4	-4	-8.3
N	SPERRY RAND	38- 38	43 1/2	-3 3/8	-7.1
A	SYSTEMS ENG. LABS	2- 8	1 5/8	- 1/4	-13.3
N	TEXAS INSTRUMENTS	83-138	99 3/8	-18 1/5	-13.3
O	ULTIMACC SYSTEMS INC	1- 11	1 5/8	- 1/8	-7.1
N	VARIAN ASSOCIATES	10- 20	8 7/8	-1 1/4	-11.2
N	WANG LABS.	13- 34	17 3/4	-2 1/4	-11.2
N	XEROX CORP	122-188	122 3/8	-7 1/8	-5.5

LEASING COMPANIES

EXCH		1973 RANGE (1)	CLOSE DEC 3 1973	WEEK NET CHNGE	WEEK PCT CHNGE
B	BOOTHE COMPUTER	0- 0	1 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2	0	0.0
O	COMDISCO INC	4- 17	4 1/4	- 1/4	-3.5
O	COMMERCE GROUP CORP	3- 4	3	+ 1/8	+4.3
O	COMPUTER EXCHANGE	1- 1	3/8	0	0.0
A	COMPUTER INVSTRS GRP	2- 8	2 7/8	- 3/8	-11.5
O	COMP. INSTALLATIONS	1- 2	1	0	0.0
N	DATRONIC RENTAL	2- 3	1 5/8	- 1/8	-7.1
A	DCL INC	0- 3	1/2	+	+14.1
A	DEARBORN-STORM	12- 26	14	-1 5/8	-10.3
N	DPF INC	3- 9	2 5/8	- 1/2	-18.0
O	EDP RESOURCES	1- 3	2 3/4	+1	+57.1
A	GRANITE MGT	2- 5	3	0	5.0
A	GREYHOUND COMPUTER	3- 8	3 1/5	- 3/4	-19.3
A	ITEL	4- 12	3 7/5	- 1/2	-11.4
N	LEASCO CORP	8- 18	10 5/8	- 3/8	-3.4
O	LEASPAC CORP	1- 8	1 1/8	+ 1/5	+12.5
O	LECTRO MGT INC	1- 2	1/4	- 1/5	-33.3
O	NRG INC	4- 15	3 1/2	0	0.0
A	PIONEER TEX CORP	5- 8	4 1/2	-3	-40.0
A	ROCKWOOD COMPUTER	1- 3	3/4	- 1/4	-25.0
N	U.S. LEASING	15- 36	15 1/2	-1 3/4	-5.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1973 RANGE (1)	CLOSE DEC 5 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/2	- 3/8	-20.0
A	APPLIED DATA RES.	2- 4	1 3/4	- 1/4	-12.5
O	APPLIED LOGIC	1- 3	1/4	- 1/4	-50.0
N	AUTOMATIC DATA PROC	39- 54	50	-3 1/4	-6.1
O	BRANDON APPLIED SYST	1- 1	1/2	0	0.0
O	CENTRAL DATA SYSTEMS	3- 8	3	- 1/2	-14.2
O	COMPUTER DIMENSIONS	2- 3	2 1/4	0	0.0
O	COMPUTER DYNAMICS	1- 2	1/2	0	0.0
O	COMPUTER HORIZONS	1- 8	2 1/4	0	0.0
O	COMPUTER NETWORK	1- 5	1 1/8	+ 1/8	+12.5
N	COMPUTER SCIENCES	2- 8	2 3/8	- 1/4	-9.5
O	COMPUTER TASK GROUP	1- 2	3/4	- 3/8	-33.3
O	COMPUTER TECHNOLOGY	1- 3	1/2	0	0.0
O	COMPUTER USAGE	3- 9	3 1/4	- 3/8	-10.3
O	COMRESS	1- 2	1/4	0	0.0
O	COMSHARE	2- 9	2 3/8	- 1/2	-17.3
N	CORDURA CORP	3- 15	3 1/4	- 5/8	-10.1
O	DATATAB	1- 4	1	0	0.0
A	ELECT COMP PROG	1- 2	5/8	- 1/4	-28.3
N	ELECTRONIC DATA SYS.	24- 58	23 3/4	-5 1/2	-18.8
O	INFONATIONAL INC	1- 2	5/8	0	0.0
O	INFORMATICS	2- 8	3 1/4	+ 1/8	+2.4
O	I.D.A. DATA CORP	1- 1	3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 5	1	0	0.0
O	KEANE ASSOCIATES	3- 5	2 1/2	-1	-28.3
O	KEYDATA CORP	8- 12	5 1/2	- 5/8	-10.2
O	LOGICON	3- 7	2 1/2	- 1/4	-8.8
A	MANAGEMENT DATA	1- 5	1 1/4	- 1/4	-18.8
O	NATIONAL CSS INC	18- 42	24	-1	-4.8
O	NATIONAL COMPUTER CO	1- 1	3/8	+ 1/8	+50.0
O	NATIONAL INFO SRVCS	1- 2	3/8	- 1/8	-23.8
P	ON LINE SYSTEMS INC	12- 25	21 1/4	+ 1/2	+2.4
N	PLANNING RESEARCH	2- 7	2 1/8	- 1/2	-18.0
O	PROGRAMMING METHODS	17- 25	17	0	0.0
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 24	3 3/4	- 3/8	-5.0
O	SCIENTIFIC COMPUTERS	1- 3	5/8	0	0.0
O	SIMPLICITY COMPUTER	1- 4	1 7/8	- 1/5	-6.2
O	TBS COMPUTER CENTERS	2- 7	4	-1 1/4	-23.8
O	TCC INC	1- 1	1/8	0	0.0
O	TYMSHARE INC	8- 13	8	- 1/2	-5.8
O	UNITED DATA CENTER	3- 8	3	0	0.0
A	URS SYSTEMS	3- 8	2 3/4	- 3/8	-12.0
N	WYLY CORP	3- 11	3	- 3/8	-17.2

PERIPHERALS & SUBSYSTEMS

EXCH		1973 RANGE (1)	CLOSE DEC 5 1973	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	10- 34	10 3/5	-1 3/8	-11.7
O	ADVANCED MEMORY SYS	4- 23	4	-1 1/4	-23.8
N	AMPEX CORP	4- 7	3 5/8	- 1/8	-3.3
O	ANDERSON JACOBSON	2- 5	1 3/4	- 3/4	-35.0
O	BEEHIVE MEDICAL ELEC	5- 10	4 1/2	- 1/4	-5.2
A	BOLT.BERANEK & NEW	8- 12	5 5/5	-1	-13.1
N	BUNKER-RAMO	8- 18	7 1/2	- 1/4	-3.2
A	CALCOMP	5- 18	7 7/8	-1 1/5	-12.5
O	CAMBRIDGE MEMORIES	8- 17	13 3/4	- 1/2	-3.5
O	CENTRONICS DATA COMP	13- 35	17	-2	-10.5
O	CODEX CORP	9- 19	8 1/2	-1 1/2	-15.0
O	COGNITRONICS	1- 3	1/2	- 1/5	-20.0
O	COMPUTER COMMUN.	1- 4	1/4	- 1/8	-33.3
A	COMPUTER EQUIPMENT	2- 3	1 5/8	- 1/4	-13.3
O	COMPUTER MACHINERY	4- 13	3 1/2	- 5/8	-15.1
O	COMPUTER TRANSCEIVER	1- 5	7/8	+ 1/8	+18.8
N	CONRAC CORP	14- 32	13 3/4	-1	-8.7
O	DATA ACCESS SYSTEMS	1- 3	1 1/4	+ 1/4	+25.0
O	DATA 100	8- 18	10 1/8	- 1/4	-2.4
A	DATA PRODUCTS CORP	2- 5	3	- 3/8	-11.1
O	DATA RECOGNITION	2- 3	1 1/2	0	0.0
O	DATA TECHNOLOGY	1- 5	1 1/2	- 1/8	-7.8
O	DECISION DATA COMPUT	8- 40	6	-1 1/2	-20.0
O	DELTA DATA SYSTEMS	1- 1	1/2	0	0.0
O	DI/AN CONTROLS	1- 4	1 1/2	0	0.0
N	ELECTRONIC M & M	3- 5	3 1/8	- 1/4	-7.4
O	FABRI-TEK	2- 5	2 1/8	- 3/8	-15.0
O	GENERAL COMPUTER SYS	3- 9	2 3/4	-2	-42.1
N	GENERAL ELECTRIC	58- 78	58 3/8	-4 1/8	-8.4
N	HAZELTINE CORP	4- 9	4 1/2	- 1/8	-2.7
O	INFOREX INC	3- 23	3 1/8	- 5/8	-10.8
O	INFORMATION DISPLAYS	1- 2	1/5	- 1/4	-88.8
O	INFORMATION INTL INC	8- 15	8 1/2	- 1/2	-3.3
A	LUNDY ELECTRONICS	3- 8	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
N	MEMOREX	2- 18	1 1/2	-1 1/4	-43.4
A	MILGO ELECTRONICS	14- 28	15 3/8	- 7/8	-5.3
N	MOHAWK DATA SCI	3- 13	2 3/4	- 1/2	-15.3
O	ODEC COMPUTER SYST.	2- 8	2 1/8	- 1/8	-5.5
O	OPTICAL SCANNING	2- 8	2 1/4	- 1/2	-18.1
O	PERTEC CORP	4- 8	3 3/4	-1	-21.0
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	3- 5	3	- 5/8	-17.2
O	PRECISION INST.	2- 8	2	- 1/4	-11.1
O	QUANTOR CORP	5- 10	4 3/4	- 1/4	-5.0
O	RECOGNITION EQUIP	2- 8	2 3/4	- 1/8	-4.3
N	SANDERS ASSOCIATES	8- 18	8 1/8	-1 3/4	-22.2
O	SCAN DATA	1- 8	2	+ 3/8	+23.0
O	STORAGE TECHNOLOGY	11- 34	12 7/5	-2 5/8	-18.5
O	SYCOR INC	8- 20	10 3/4	+ 1/4	+2.3
O	TALLY CORP.	2- 14	1 5/8	- 1/2	-23.5
O	TEC INC	5- 8	3 3/4	+ 1/4	+4.5
N	TEKTRONIX INC	30- 33	39 1/2	-3 1/2	-8.1
N	TELEX	3- 8	3	- 1/2	-14.2
O	WANGCO INC	7- 13	7 3/5	-1	-11.9
O	WILTEK INC	7- 18	7	-1	-12.5

SUPPLIES & ACCESSORIES

EXCH		1973 RANGE (1)	CLOSE DEC 5 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	5- 8	5 3/4	- 3/4	-11.3
A	BARRY WRIGHT	5- 13	5 1/8	0	0.0
O	CYBERNATICS INC	1- 3	1 1/4	5	0.0
A	DATA DOCUMENTS	17- 25	20	0	0.0
O	DUPLEX PRODUCTS INC	7- 10	7 3/5	+ 1/5	+1.7
N	ENNIS BUS. FORMS	5- 8	4 3/4	- 3/5	-7.3
O	GRAHAM MAGNETICS	8- 20	7 3/4	- 3/4	-5.5
O	GRAPHIC CONTROLS	7- 12	7 3/8	5	0.0
N	3M COMPANY	78- 91	75 5/5	-4 1/4	-5.3
O	MOORE CORP LTD	53- 55	53 3/4	-5 1/2	-9.2
N	NASHUA CORP	38- 55	38 1/5	-5 7/5	-13.5
O	REYNOLDS & REYNOLD	25- 51	25 1/2	-3 3/4	-11.2
O	STANDARD REGISTER	12- 28	11 5/8	-1 3/8	-15.5
O	TAB PRODUCTS CO	8- 23	5 1/2	- 1/2	-5.5
N	UARCO	15- 23	14 3/4	-1 1/2	-5.2
A	WABASH MAGNETICS	5- 8	5 1/8	- 1/8	-2.3
N	WALLACE BUS FORMS	15- 25	15 1/5	-1 5/5	-9.1

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